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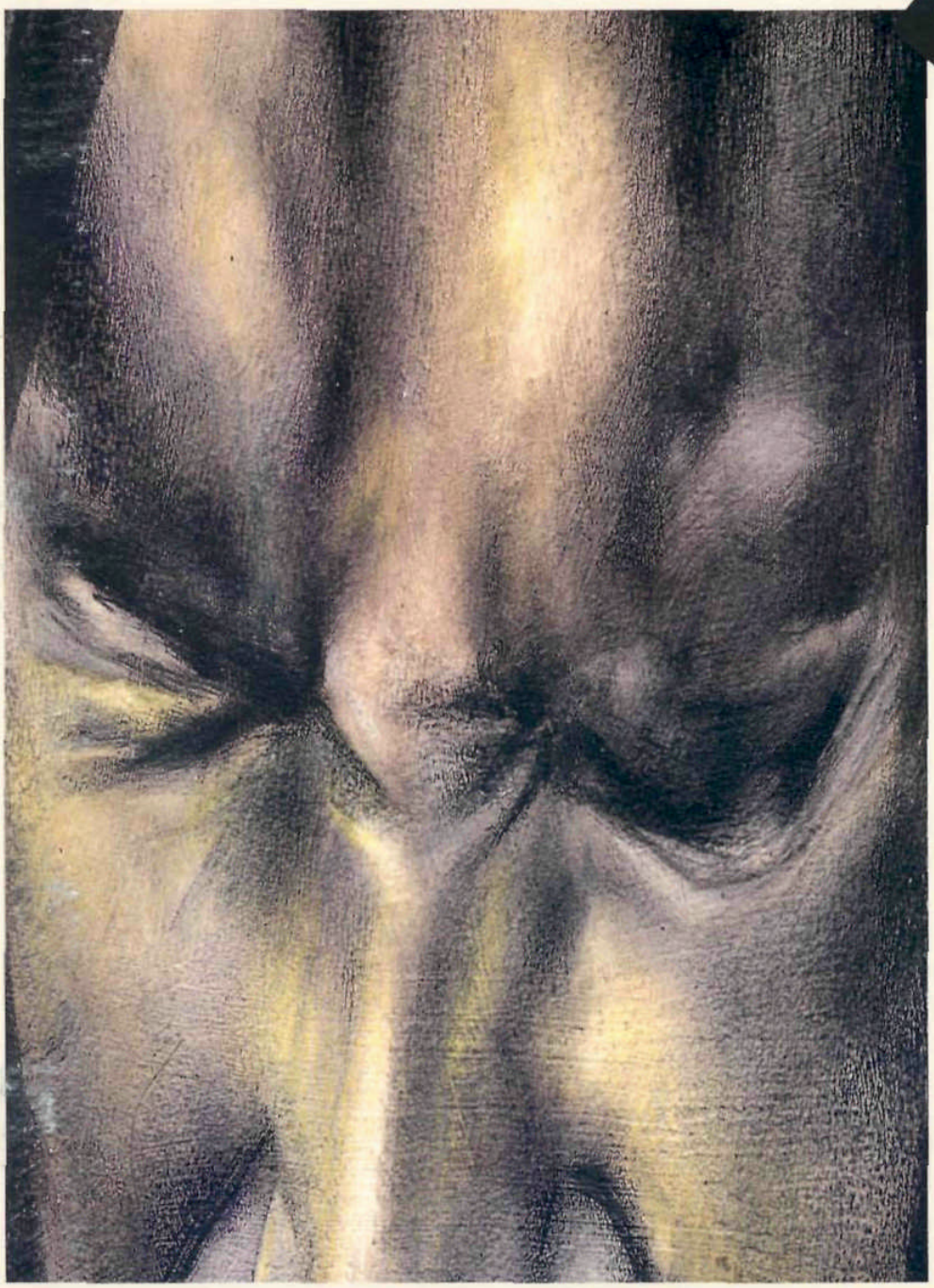

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PUBLISHED BY THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

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Manuscripts, letters, books for review, and editorial inquiries should be addressed to Kendrick Frazier, Editor, SKEPTICAL INQUIRER, 944 Deer Drive NE, Albuquerque NM 87122-1306. FAX 505-828-2080. For Guide for Authors, see pages 557-558 of Fall 1994 issue.

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Editor's Note

Three Culture Clashes

Articles in this issue focus on three important topics where clashes between scientific and nonscientific viewpoints have erupted into major social and cultural controversies—the debate over repressed memories, the rising antiscience movement in academia, and scientific creationism.

In "Remembering Dangerously," psychologist Elizabeth Loftus critically examines the modern superstitious fervor—which she compares to the witch-hunt trials of earlier centuries—that results in serious accusations of child sexual abuse based on "memories" that didn't exist prior to the person's undergoing therapy. We've been reporting on this issue regularly, most recently in Martin Gardner's "The Tragedies of False Memories" (Fall 1994), but Loftus presents still more troubling evidence of the danger of uncritical acceptance of repression theory. Loftus, by the way, was the recipient of CSICOP's 1994 In Praise of Reason Award for her research in memory and eyewitness testimony.

In two articles and three book reviews we then examine the resurgence of antiscience in academia, beginning with an article by biologist Paul R. Gross and mathematician Norman Levitt, authors of the recent provocative book on this issue, Higher Superstition. *They emphasize that criticisms based on knowledge of the field are a welcome and valuable part of science, but that the new critics, who for the most part are uninterested in the content of science, are questioning the very value of science as a way of understanding nature.*

Then in a brief investigation, Dan Larhammar, a Swedish biomedical scientist, reveals serious problems, including references that don't check out, with what may be the only paper published in a mainstream scientific journal of a creationist claim based on molecular data.

Finally, folklorist Jan Harold Brunvand, of urban-legends fame, describes in detail an example of a "faxlore phenomenon," and points out how this particular one gained credence because of society's jitters about crime and safety.

• • •

Readers seem to like our new, enlarged format. Initial comments we've received from subscribers about our January-February issue have been overwhelmingly positive, and the response at the newsstand has been likewise gratifying. We want to know what you *think, so if you have any comments, suggestions, or criticisms, let us know.*

News and Comment

'Columbus Poltergeist' Tina Resch Imprisoned In Daughter's Murder

Tina Resch, the central figure in the famous 1984 Columbus, Ohio, poltergeist case, has now been sentenced to life in prison in the death of her daughter.

On March 6, 1984, then 14-year-old Tina Resch—now named Tina Boyer—appeared on the front page of the *Columbus Dispatch* with a telephone receiver seemingly flying across in front of her. The story went global instantaneously.

An artist's rendition of a widely published photo sold by the *Columbus Dispatch* to Associated Press.

James Randi investigated the claims of a poltergeist in the Resch household. His analysis of photographs taken by the *Dispatch* showed conclusive evidence that the girl was bamboozling her foster parents, the media, paranormal researchers, and the public (Randi, "The Columbus Poltergeist Case: Flying Phones, Photos, and Fakery," *SI*, 9:221-242, Spring 1985). A television crew also accidentally videotaped her tipping over a lamp by hand and then pretending it had happened by itself. The record showed that Tina was hyperactive and emotionally disturbed.

A decade after these events, Tina Boyer on October 24, 1994, pleaded guilty in a Carroll County, Georgia, courtroom to the murder of her three-year-old daughter, Amber, and was sent to prison for life. The court record showed she had married at 16, divorced, married again, divorced, and then taken up with David Herrin, who was also charged in Amber's death. According to the *Atlanta Constitution* (October 25, 1994), prosecutors in the Carroll County murder case documented 33 alleged transgressions against the child. They claimed she had been repeatedly struck, severely scalded, locked in a closet, and burned with a cigarette.

Although a few people involved in the case stick to their belief that Tina had shown telekinetic poltergeist powers back in 1984, "There's no question in our minds, the girl was cheating," Paul Kurtz, chairman of CSICOP told *Atlanta Constitution* reporter Billy Torpy. "She was so good at it that she deceived people constantly. She was seeking attention and everybody fell for it. I think all this was a factor in a destructive course later on."

—*K.F.*

National Enquirer Reverses Conclusions of UFO Study Published in *SI*

Rutgers University sociologist Ted Goertzel was shocked to find that he was featured in the November 29, 1994, *National Enquirer*. The story? "Top University Researchers Reveal . . . 8 million Americans may have been abducted by UFOs." Goertzel, who teaches social research methods at the State University's Camden (New Jersey) campus, says he was honored to be named a "top university researcher" but dismayed to be put into the camp of UFO true believers.

Goertzel's study, published in the Spring 1994 SKEPTICAL INQUIRER ("Measuring the Prevalence of False Memories: A New Interpretation of a 'UFO Abduction Survey'") actually found that "the public can rest assured that there is no evidence that millions of Americans are being abducted." According to Goertzel, the *Enquirer* selected items out of context and used quotes from researchers at other universities.

"This story completely *reverses* the conclusions of our research," says Goertzel. "We concluded that UFO abductions were a false-memory phenomenon." The findings were based on interviews with 697 New Jersey residents conducted by students in Goertzel's research-methods course. The questionnaire included items that other researchers had used as indicators of UFO abduction, but added questions designed to place these items in a broader psychosocial context. The Rutgers researchers found that people who reported "UFO abduction experiences" were also likely to believe in conspiracy theories of various kinds, to receive extrasensory messages from deceased relatives, to see halos around people's heads, and to believe in astrology. These people often find it difficult to deal with the stress in their lives, or to trust friends, neighbors, and family members.

"Unfortunately, these are exactly the kind of people who are gullible enough to believe what they read in the *National Enquirer*," Goertzel observes. Ironically,

Goertzel is the author of *Turncoats and True Believers* (Prometheus Press, 1992), which explores the psychology of people who persist in beliefs that go against objective evidence. Now the *National Enquirer* has falsely put him into that category. *Philadelphia Inquirer* writer David Lee Preston contacted *National Enquirer* general editor, Charlie Montgomery, whose byline appeared at the end of the article.

"I'll tell you the truth; my name went on it because I was the editor of the story," he told Preston. "The story was done for us by a freelancer. You gotta remember, we also have other people mentioned in that file. Goertzel did one thing, and these other guys are talking about other things here. It's all part of the same thing.

"I mean, we didn't necessarily change his words around. It's like you're talking to three different people and you get three different things."

But the story clearly says Goertzel's study reinforces the idea that millions of people have indeed been abducted.

Goertzel was busy assuring colleagues his conclusions had been reversed. He has asked the *Enquirer* for a retraction. "I think it damages my professional reputation to have my work misrepresented in this way," he said.

8 million Americans may have been abducted by UFOs
. . . TOP UNIVERSITY RESEARCHERS REVEAL
How to tell if aliens kidnapped you

A clipping from the Nov. 19, 1994 *National Enquirer* story that reversed the conclusions of Goertzel's research.

Bélmez Faces Turned Out to Be Suspiciously 'Picturelike' Images

In August 1971, a peasant woman named María Gómez de Pereira noticed for the first time a strange face on her kitchen floor, and it filled her with fear. The news quickly spread throughout the town, and María's neighbors wasted no time in making sure that national and foreign newspapers were aware of the news as well. That day saw the birth of the most spectacular, extraordinary, transcendent, and controversial case that the European parapsychology community could ever have imagined.

One of the many 'faces of Bélmez.'

So might begin a credulous account of the internationally famous "faces of Bélmez." (Bélmez de la Moraleda is a small Spanish town in the province of Andalucía.) But when I lived in Barcelona from 1991-1992 and phoned José Luis Jordán, one of the most vocal skeptics in Spain, he told me that María had painted the face and that another hoaxer had continued the game with subsequent faces. According to Jordán, it is easy for anyone to make a crude sketch of a human face with a corrosive liquid sold in Bélmez's drugstores.

Although the first "apparition" originated 20 years ago, the case still makes news today. Since then, many other faces have "appeared" in María's humble house. Almost all have been photographed and published in the Spanish and foreign press, and continue to be today.

Originally, each visitor paid 10 pesetas to see the faces, and María charged 15 additional pesetas for each photograph. A local newspaper (*Lecturas*, March 3, 1972) stated that the Pereira family had earned more than 250,000 pesetas by that time. At the height of the craze, about a thousand pilgrims visited the house each day. This moved the mayor of Bélmez to forbid the tourist trade.

Despite the prohibition. Bélmez continues to be a site for psychic pilgrimages. When I visited the little town in February 1992, talked to María, and paid her 5,000 pesetas ($50 dollars) to photograph the faces, my position was rather neutral. Now, however, after publishing a technical paper on the case in the *Journal of the Society for Psychical Research* (July 1993), I realize that my former neutrality was a bit inattentive. The photo I took of the face called *La Pelona* ("The Bald One") has all the signs of having been sketched by an inexperienced hand—even infantile, I would say. And the same can be said of the other ten faces I photographed.

The Bald One could have been painted or sketched with a chemical acid as suggested by Jordán. In the past two decades María, or someone else in the Pereira family, may have been perpetrating a hoax for financial gain. Norwithstanding the suspicious picturelike appearance of the faces, occultist writers like the late D. Scott Rogo and "serious" parapsychologists like Hans Bender considered them to be amazing instances of *Geisterporträts*.

—César J. Tort

César Tort is an editor in Tlalpan, Joya, Mexico.

In Brief

Two of the four cumulatively best-selling books of 1994 had mystical or New Age themes: *Embraced by the Light*, by Betty J. Eadie, about near-death experiences, was No. 2, and *The Celestine Prophecy*, by James Redfield (reviewed critically in our January-February issue), was No. 4. The rankings, which combine hardcover and paperback sales, come from *USA Today*'s "Top Sellers of 1994" list (December 21). Of the 100 books on the list, 30 were nonfiction, and none of those had science or science-related themes.

Uri Geller Loses Appeal of Sanctions Awarded CSICOP

The following is excerpted from the December 9, 1994, District of Columbia Court of Appeals decision in Uri Geller v. James Randi and CSICOP.

Before WALD, SENTELLE, and ROGERS, *Circuit Judges.* Opinion for the Court filed by *Circuit Judge* SENTELLE.

I. BACKGROUND

Appellant Uri Geller, a citizen of Israel and a permanent resident of England, is a self-proclaimed psychic who uses his putative "powers" to accomplish such remarkable feats as reading minds or bending spoons and suspending cable-cars in mid-air with nothing but sheer mental force. Geller has built a career and reputation on attempted demonstrations of these psychic "skills," appearing on numerous television programs such as "The Tonight Show with Johnny Carson" and being featured in countless newspaper and magazine articles. Among Geller's critics is James Randi, an accomplished magician, author and lecturer, better known as "The Amazing Randi." Randi was a founding member of the Committee for the Scientific Investigation of Claims of the Paranormal ("CSICOP"), an organization dedicated to investigating, among other things, claims of psychic phenomena such as those made by Geller. Since Geller's rise to prominence in the early 1970's, Randi has set about exposing various Geller feats as the fraudulent tricks of a confidence man.

In an April 9, 1991, article in the *International Herald Tribune,* Randi discussed Geller's claimed psychic abilities, stating that Geller "tricked even reputable scientists" with tricks that "are the kind that used to be on the back of cereal boxes when I was a kid. Apparently scientists don't eat cornflakes anymore." Based solely upon these statements, Geller filed suit against both Randi and CSICOP in United States District Court, alleging defamation, false light invasion of privacy, and tortious interference with prospective advantage. The original complaint did not attribute any specific conduct to CSICOP; however, Geller amended his complaint to allege that "Defendant Randi was acting individually on his own behalf and/or as a duly authorized actual and/or apparent agent, servant, employee and/or representative of the Defendant, CSICOP."

On January 15, 1992, eight months after Geller filed suit in district court, CSICOP filed motions for summary judgment and Rule 11 sanctions against Geller. In support of its motion for sanctions, CSICOP argued that Geller could not have reasonably believed that his complaint was well grounded in fact or warranted by law and that the complaint was filed for purposes of harassing CSICOP. Geller responded on January 29, 1992, by filing a motion for extension of time to oppose CSICOP's motions—presumably in order to give Geller additional time for discovery. The district court granted Geller's motion and ordered him to respond to CSICOP's motions by March 13, 1992. When the deadline arrived on March 13, Geller filed another motion for an extension of time until ten days after he received a transcript of a deposition of CSICOP's corporate representative conducted that day. The district court never ruled on that motion. Instead, attorneys for both parties agreed at a later deposition attended by Geller that Geller's request for a ten-day extension of time would lapse on April 29, 1992. Geller did not file a response by that date. On May 28, 1992, CSICOP filed a motion for leave to file a supplemental memorandum in support of its motions. CSICOP served this motion and the accompanying memorandum upon Geller, who again failed to respond.

After Geller failed to respond to either the summary judgment or sanctions motion, CSICOP moved on June 10, 1992, for expedited consideration of both motions. Again, CSICOP served its motion upon Geller's counsel, who neither opposed it nor took any further steps with respect to the underlying motions for summary judgment and Rule 11 sanctions. On July 2, 1992, the district court granted all of CSICOP's motions, including the Rule 11 sanctions motion, as "unopposed." Shortly thereafter, Geller filed successive motions for reconsideration, arguing that it was "inappropriate" to respond to CSICOP's motions because the district court had not ruled on its second motion for extension of time. The district court denied both motions for reconsideration, noting that its failure to rule on the second motion for extension of time did not relieve Geller's counsel of the duty to file opposition within the time required by local and federal rules. The district court explained that when Geller failed to respond to the summary judgment and sanctions motions, both motions were properly treated as conceded under C, Local Rule 108(b), which provides that a motion may be treated as conceded if it is not answered within 11 days of the date of service. . . . Because Geller had not adequately explained his failure to respond, he was not entitled to reconsideration.

After denying Geller's second motion for reconsideration on July 27, 1993, the court entered judgment against Geller in the amount of $149,000, representing fees and costs incurred by CSICOP in defending this action. Geller appeals from this entry of judgment of Rule 11 sanctions.

II. DISCUSSION

A. *Jurisdiction*

Although both parties correctly agree that this court has jurisdiction to hear this appeal, CSICOP argues that, in light of Geller's post-judgment conduct, we should decline to exercise that jurisdiction. CSICOP asserts that, since entry of judgment by the district court, Geller has neither satisfied the judgment nor posted an appropriate bond, and that he has secreted his assets abroad in an attempt to abuse judicial processes. Consequently, because Geller has allegedly flouted judicial authority, he should not be allowed to prosecute this appeal.

In support of its argument, CSICOP analogizes to the doctrine of "fugitive disentitlement," in which fugitive criminal defendants have been denied an appeal for failure to submit themselves to lawful criminal authorities. . . .

Although CSICOP's argument appears to have at least facial appeal, we need not decide whether we possess the discretion supposed by CSICOP. CSICOP's argument is not truly jurisdictional; indeed, as both parties concede, this court has jurisdiction over this case. . . . Because we have crossed the jurisdictional threshold, we may reach the merits of this dispute without considering appellee's invitation to decline jurisdiction in our supposed discretion; and because the merits of this case so clearly favor CSICOP, the party inviting this court to decline jurisdiction, we need not detain ourselves with CSICOP's invitation, and turn instead to the merits of Geller's appeal. . . .

B. *Rule 11 Sanctions*

Although Rule 11 of the Federal Rules of Civil Procedure was revised effective December 1, 1993, the district court imposed sanctions under the pre-revision rule; thus, our review is limited to that former rule, which provided, in relevant part:

> Every pleading, motion and other paper of a party represented by an attorney shall be signed by at least one attorney of record in the attorneys individual name, whose address shall be stated. . . . The signature of an attorney or party constitutes a certificate by the signer that the signer has read the pleading, motion, or other paper; that to the best of the signer's knowledge, information, and belief formed after reasonable inquiry it is well grounded in fact and is warranted by existing law or a good faith argument for the extension, modification, or reversal of existing law, and that it is not interposed for any improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of litigation. . . . If a pleading, motion, or other paper is signed in violation of this rule, the court, upon motion or upon its

> own initiative, shall impose upon the person who signed it, a represented party, or both, an appropriate sanction, which may include an order to pay to the other party or parties the amount of the reasonable expenses incurred because of the filing of the pleading, motion, or other paper, including a reasonable attorney's fee.
>
> FED. R. CIV. P. 11 (1993).

In reviewing the district court's imposition of sanctions under Rule 11, our review is limited to a determination of whether the district court abused its discretion. . . . In this case, the district court imposed Rule 11 sanctions by default under Local Rule 108(b), which provides:

> Within 11 days of the date of service or at such other time as the court may direct, an opposing party shall serve and file a memorandum of points and authorities in opposition to the motion. If such a memorandum is not filed within the prescribed time, the court may treat the motion as conceded.

. . . The court treated the motion for sanctions as conceded when Geller failed to respond to the motion within the time period prescribed by the rule.

Geller claims that the district court abused its discretion in treating CSICOP's sanctions motion as conceded because a plain reading of Rule 11 indicates that sanctions should not be granted by default or concession. Rule 11 requires a "pleading, motion or other paper" to be filed in violation of the rule before sanctions can be granted. Geller maintains that this requirement is not met here because no such paper or motion was filed, but that, in fact, he was sanctioned because he *failed* to file a response to CSlCOP's motion. Geller's argument mischaracterizes the district court's decision, however. In support of its initial motion for sanctions, CSICOP complained that "Geller has not a shred of factual or legal support for the allegations in his Complaint that CSICOP can be held legally responsible for statements made by Randi without its knowledge or authorization." . . . As this allegation makes clear, CSICOP's request for sanctions was directed at the filing of Geller's initial complaint. When Geller failed to respond to the sanctions motion, the trial court concluded that he had effectively conceded under Local Rule 108(b) that his original complaint was not well grounded in fact or warranted by law. Consequently, the sanctions were not based upon Geller's failure to answer; rather, they were based upon Geller's filing of a frivolous complaint. Rather than finding Geller's failure to answer to be a sanctionable act, the court, at most, treated it as a concession that he had, in fact, filed such a complaint.

Rule 11 expressly authorizes sanctions for groundless complaints when it states that if "a *pleading,* motion or other paper is signed in violation of this rule, the court . . . shall impose upon the party who signed it, a represented party, or both, an appropriate sanction." . . . We find nothing in the Rule that limits its applicability in cases in which a party fails to respond to a motion for sanctions. On the contrary, we conclude that, under District of Columbia local rules, a party can be sanctioned for a Rule 11 violation if that party fails to respond to a motion for Rule 11 sanctions. . . . Local Rule 108(b) is a rule of neutral applicability; it is not qualified in any way by the language of Rule 11 of the Federal Rules of Civil Procedure—it applies equally when a party fails to respond to a Rule 11 motion. We think it would be absurd to allow a party to concede an entire case by default while restricting the same party's ability to concede a motion for Rule 11 sanctions. . . . Consequently, the district court properly treated CSICOP's sanctions motion as conceded by Geller under Local Rule 108(b).

Turning to the underlying complaint, Geller argues that the complaint, was indeed well grounded in fact and warranted by existing law under a theory of "apparent agency." Based upon our discussion of Local Rule 108(b), however, we need not reach this argument. Regardless of the merit of this claim, Geller cannot raise it now. The proper time for Geller to have raised this defense would have been in responding to CSICOP's motion for summary judgment. *See Weil v. Seltzer* 873 F.2d 1453,1459 (D.C. Cir. 1989) (concession of motion under Local Rule 108(b) acts as waiver; party cannot raise conceded argument on appeal). . . . When Geller failed to respond, he conceded a violation of Rule 11 under Local Rule 108(b); he cannot now argue the merits of his Rule 11 defense.

Finally, Geller complains that the district court's imposition of sanctions should be overturned because it is not adequately supported by findings of fact. We agree that, in cases in which a motion for sanctions is opposed, our review is aided when a trial court supports a sanctions order by "explicit findings of fact on either the exact basis underlying the sanctions or the reasonableness of the exact sanction chosen." . . . Under these circumstances, however, we are unwilling to mandate such findings of fact to support the district court's order. In this case, the district court's basis for imposing sanctions is obvious. In its sanctions order, the district court handwrote the word "unopposed" in its description of CSICOP's sanctions motion. Later, in its denial of Geller's motion for reconsideration, the district court explained that it had treated the motion as conceded under Local Rule 108(b). Thus, the court treated the allegations in support of CSICOP's motion as true. The district court's reliance upon Local Rule 108(b) provides us a basis to determine the sanctions order to be reasonable. The reasonableness of the specific sanction levelled against Geller was conceded by him.

We find ample support for the district court's imposition of sanctions against Geller. Rule 11 expressly authorizes the imposition of sanctions against a "represented party" for violation of the rule. As the advisory committee notes to Rule 11 state, "Even though it is the attorney whose signature violates the rule, it may be appropriate under the circumstances of the case to impose a sanction on the client." . . . Given Geller's litigious history, we find no abuse of discretion in this direct imposition of sanctions. The district court properly treated the sanctions motion as conceded by Geller under Local Rule 108(b). Although the size of the sanction is substantial, we find no abuse of discretion here, given the aggravated facts before the district court. Accordingly, the judgment of the district court is

Affirmed.

CSICOP Comments on Appeals Court Ruling

Barry Karr, executive director of CSICOP, made the following statement in response to the court's ruling:

"The enjoyment of our victories in court—such as the one above—is somewhat tempered by the reality that we still have not collected a cent of the sanctions award ($150,000 plus interest) and it doesn't appear likely that Geller is going to send us a check anytime soon.

"We are determined to do what we can to collect, but the legal battle continues and, indeed, may escalate. The Associated Press reports that Geller's attorney, Richard Winelander, said that he would ask the full appeals court to reconsider the case and that he will apply to the Supreme Court if he loses. Geller has already lost a decision in the District Court, two motions for reconsideration in the District Court, and this latest decision by the U.S. Court of Appeals. It seems that whenever we take one step forward we are forced to talk half a step back.

"As always the lawyers need to be paid, and the decision in the appeals court does not negate our responsibility for these costs. At the time of this writing CSICOP owes close to $15,000 in legal fees dating back to May 1994, and the amount will only increase. Our total legal bill is well over $250,000. The CSICOP Legal Defense Fund is in serious need of public support."

Our coverage of the 1994 CSICOP conference in Seattle, Washington, June 23-26, begun in our last issue, continues.

The Psychology of Belief Part II: Perception, Memory and the Courtroom

TOM GENONI, JR.

How We Fool Ourselves: Anomalies of Perception and Interpretation

Introducing the session focusing on how we fool ourselves, Barry Beyerstein, a professor of psychology at Simon Fraser University, Vancouver, British Columbia, emphasized that "so-called simple perceptions are anything but simple" and that what we see is not always the true nature of reality. Perception is a creative act that involves not only the purely sensory apparatus of the brain but also such things as memory, emotion, and our hopes and fears. Often we fill in our observations of reality with the way we think things should be, based on our expectations. And when these misperceptions become part of our memory, Beyerstein concluded, they can affect new perceptions and interpretations.

Jerry Andrus amazes the audience with his tricks and illusions.

The idea that "so-called simple perceptions are anything but simple" was dramatically illustrated by magician and inventor Jerry Andrus. Based on the concept that perceptions are easily altered by expectations, Andrus has created many optical illusions and magic tricks that fool the observer. "Each person paints their picture of reality with a brush dipped in the pigments of the past," he said. With a simple demonstration using what appeared to be a deck of cards (but which he revealed was really a thick piece of Plexiglas), Andrus illustrated how the assumptions we make about reality, based on years of ordinary, day-to-day experiences, often lead us to "see" things that do not exist. In another example of playing with expectations, Andrus removed the glasses he had been wearing since the beginning of his talk, admitting: "They contain no glass. I wear contacts." Accompanied by abundant laughter and applause, Andrus continued his performance with a number of large optical illusions that he manipulated to produce further false perceptions.

Andrus also read a short commentary, "How Sees the Mind?" It poetically described the "rubber rulers" of perception that humans stretch to fit their subjective measure of reality. "What we should be using, wherever possible, are the objective rulers of science that resist being stretched or shrunk to fit what we want it to be. These rulers may not be perfect, but unlike ours, are made not of rubber, but of the laws of the universe."

Susan Blackmore, senior lecturer in psychology at the University of the West of England, in Bristol, described some of the research she has conducted on out-of-body and near-death experiences. Blackmore contends that these phenomena reveal a great deal about the way our minds operate. She explained that when humans approach death, the brain releases endorphins, which can produce a morphinelike pleasure and a random firing of neurons. These physiological occurrences may result in the often reported tunnel images, bright lights, and many other bizarre "out-of-body" effects.

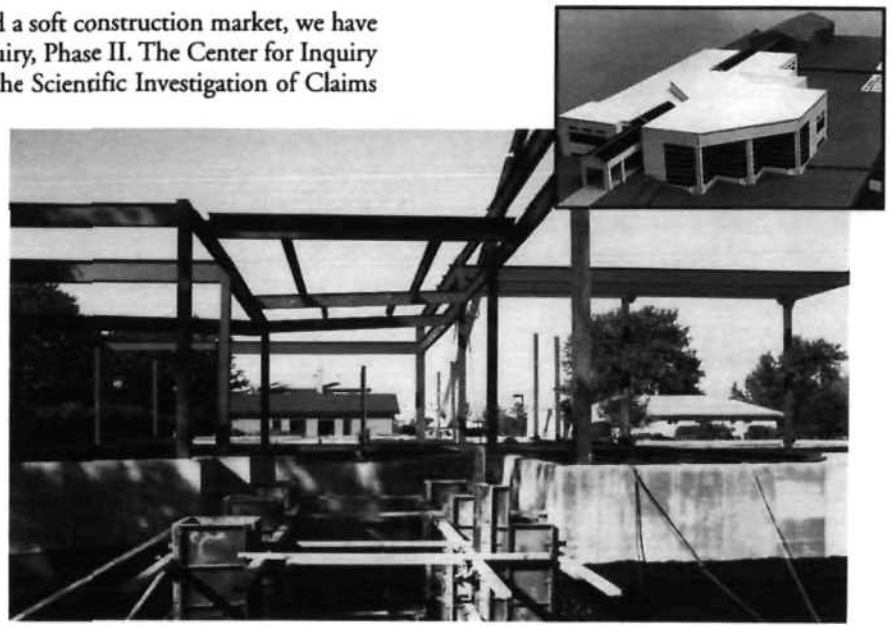
Blackmore also posed questions about the nature of the self, which constructs a reality based on perception. As the body shuts down, the mind is rapidly unable to sustain a model of "I" based on its usual conception of reality. The out-of-body experience, Blackmore suggests, may be "a crude attempt by the brain to hang on to the idea of self."

Elizabeth Loftus, a professor of psy-

Headquarters Campus for CSICOP and the Skeptical Inquirer

A Progress Report

Taking advantage of low-interest rates and a soft construction market, we have begun construction of the Center for Inquiry, Phase II. The Center for Inquiry is the headquarters of the Committee for the Scientific Investigation of Claims of the Paranormal and the Council for Democratic and Secular Humanism (CODESH), with which for economic reasons CSICOP has shared facilities since 1980.



This is the long-awaited consolidation of SKEPTICAL INQUIRER's Buffalo-area administrative, editorial, production, and warehousing activities in one efficient facility.

Ground-breaking was in late May 1994, and the plan is for occupancy in early 1995.

Located adjacent to the Amherst Campus of the State University of New York at Buffalo—the largest campus of the nation's largest state university system—the Center for Inquiry will provide the permanent, multi-purpose home base that the skeptical movement has long required.

Numerous opportunities exist for naming rooms and structures after friends or loved ones. The Phase II building of the Center for Inquiry itself remains to be named for a gift of $1,000,000; the Computer Center, for a gift of $250,000.

Construction Now Under Way!

- New building on two floors, expandable for the future
- Eye-catching new contemporary design
- Will house the world's largest skeptical library– -computerized catalogue accessible via modem from anywhere in the world
- Conference and seminar facilities, with full audio-visual support
- Dedicated audio-video-TV production and duplication facility. For larger productions, multimedia conference room converts to 3-camera television studio.
- Additional, efficient office space to provide for CSICOP's past and future growth

Construction Cash Is Still Short

We will realize important savings by having started construction this summer, although our "Price of Reason" Capital Fund Drive is still in progress. Under Co-Chair Martin Gardner this campaign has reached more than 85 percent of the CSICOP/CODESH construction and endowment goals. To maintain our momentum, additional cash gifts for construction are urgently needed.

Martin Gardner

Please support the "Price of Reason" Capital Fund Drive today. For more information, use the postpaid response card in this issue or contact CSICOP today at 716-636-1425.

chology at the University of Washington, in Seattle, is a well-known expert on eyewitness testimony, and her recent work examining the malleability of memory has provided many insights into the repressed memory debate. (See her article "Remembering Dangerously" in this issue.) In some of her studies, Loftus said, she succeeded in altering her subjects' memories of some details of scenes they had witnessed, through the use of misleading questioning, misinformation, and suggestion. Another study, using a series of crime scenarios, revealed an even larger frequency of false memories in her test groups. But could a memory of an entire event that never happened be created using these tactics?

Elizabeth Loftus reports her findings in studies involving memory and eyewitness testimony.

Loftus attempted to create in the mind of a teenage subject named Chris the memory of being separated from his family in a mall ten years previously and being found by an older man. Chris entered this alleged incident in a daily journal and, gradually, he vividly "remembered" and even expanded upon the episode that Loftus had originally described to him.

Regarding therapists and patients in clinical environments, Loftus said: "I believe there is evidence that, in some cases, a significant amount of suggestion may be going on. . . . Could this kind of suggestion act in a way that is similar to the suggestion we see here?" Loftus has examined evidence gathered by private investigators and others who secretly taped their sessions with a therapist. In one instance, a therapist diagnosed "incest survivor" at the first meeting. Loftus has received many disturbing letters from families who have been torn apart after a member of the family "recovered" abuse memories during therapy sessions. Loftus concluded: "I think that this kind of activity and practice dilutes and trivializes the experience of true abuse survivors and increases their suffering."

In addition to the scheduled speakers, James Randi and his assistant, José Álvarez, played a videotaped segment of an Australian "60 Minutes" TV segment. As the host of the show explained, a channeler named José had been making a name for himself by demonstrating his apparent ability to channel an ancient spirit named Carlos. Appearing with his sleazy manager on numerous TV talk-shows, José would enter a strange trance and begin to slouch over. Just as his heart rate would slow to a near-death level (always being monitored by a competent physician), the exuberant spirit of Carlos would dramatically emerge to offer his words of wisdom. The Carlos mania culminated in an appearance to a near-capacity crowd at the Sydney Opera House.

As you may have guessed, Carlos is not an ancient spirit. Carlos is a product of James Randi's imagination, with a few tricks and some clever acting by his good friend José Álvarez. After José would enter his trance and slow his pulse (by taping a small ball under his biceps and then gently squeezing), Randi would send the astounding words of Carlos to a tiny speaker in José's ear via a remote mike. It may not have been surprising that the Australian public was so eager to listen, but the ease with which José (and Carlos) was able to get such attention, publicity, and access to the press was disturbing.

Carl Sagan's Keynote Address

Introduced to the standing-room-only audience by CSICOP Chairman Paul Kurtz as a "Leonardo man of thought and action" because of his broad range of scientific study and knowledge, Carl Sagan, the astronomer and author, focused his keynote address on the importance of scientific understanding. Stressing the predictive power of science and the significant role it plays in so many aspects of our culture, Sagan affirmed our responsibility to educate society about its function. "We have a civilization based on science and technology and have cleverly arranged things so that almost no one understands science and technology," he said. He also warned that it "is a clear prescription for disaster" if the circumstances are not changed.

Sagan praised the role of CSICOP and the SKEPTICAL INQUIRER in exposing unfounded scientific claims but cautioned skeptics against establishing an "us versus them" mentality by ridiculing and belittling paranormal believers. He also encouraged compassion for those who succumb to the tricks of pseudoscientific con-artists simply because they are not well versed in science, magic, and skepticism.

Sagan also discussed the rigid standards of scientific scrutiny, the complex struggle of inquiry, the great rewards of discovery, and the vigorous and uncompromising role of experimental testing in evaluating ideas. "And though it is no fun to be on the receiving end of skeptical questioning," Sagan concluded, "it is the affordable price we pay for having such a powerful tool as science." Sagan's keynote address was published in the January-February *SI* as "Wonder and Skepticism."

Memory: How Reliable Is It?

Carol Tavris, a psychologist and author from Los Angeles, opened the session called "Memory: How Reliable Is It?" by answering: "Not very." Tavris has recently examined the "pop-psych" books about recovered memory. She found there was "no overlap" between what the books were promoting and what the academic researchers were

discovering. Tavris metaphorically described memory as a putting together of tattered pieces that were initially experienced as seamless.

Stephen Ceci, a professor of psychology at Cornell University, and the session's first speaker, was praised by Tavris for his extensive research on memory. Ceci cited some common types of memory errors and their interesting though sometimes sad results. He provided examples to illustrate how remembrances of contemporaneous events can frequently be mixed together, how experiences can occasionally be remembered in a self-serving way, and how highly emotional or aroused states can cause false recollections.

Ceci also described various studies in which the memories of numerous children were altered by repeated suggestive questioning. He pointed out that, according to national averages, children in court cases will often receive three and a half to eleven formal interviews prior to testifying. The number of informal, and possibly highly suggestive, discussions with worried parents and therapists is unknown. Given the fact that between 18 and 28 percent of children testifying in criminal and civil court cases are of preschool age, Ceci believes the use of children's memories in the courts is potentially very dangerous.

"Suggestive techniques work very well if there's something to elicit," Ceci concluded. "The problem is the price you pay if there isn't something there."

Richard Ofshe, professor of sociology at the University of California at Berkeley, compared the proliferation of recovered-memory therapists to the grim lobotomy operations that occurred at the rate of five thousand a year during the thirties, forties, and fifties. "We are in the midst of a crisis," Ofshe said. "[Therapists] are subjecting people to the closest thing to the experience of rape and brutalization that can ever be done without actually touching them." He pointed out that some of these harmful persuasion techniques are being used not only by recovered-memory therapists but also in past-life therapy, alien-abduction therapy, and during police interrogations that, in some cases, have led to sincerely believed false confessions of crimes, including murder.

Ofshe said that prior to 1980 "no human society has ever noted this supposed ability to remove from consciousness vast amounts of information." He said that while there is no evidence for the existence of recovered memories, there is data establishing the dangers of hypnotherapy as well as the ease with which therapists can produce false memories.

"Suggestive techniques work very well if there's something there to elicit. The problem is the price you pay if there isn't something there."

Loren Pankratz, a clinical psychologist from Portland, Oregon, added a historical anecdote. Pankratz told the story of a con-artist named Davey to illustrate the perpetual unreliability of human perception. In the late 1880s, Davey was able to deceive even the best critical minds using the spirit "channeling" method of slate writing. The technique was widely popular for many years and, among those practicing it, Davey was respected as genuine and trustworthy. Research that later exposed slate writing as fakery and dismissed the anecdotal evidence of Davey's power as "worthless" prompted one stubborn believer to say that "Davey is actually a medium who is deceiving the public and himself."

With a degree of irony, Pankratz concluded: "Back in those old times it was really hard to convince some people that memory just isn't very reliable."

CSICOP and the Law

At a luncheon talk, Brenton VerPloeg, an attorney with the Miami law firm of Shutts and Bowen, provided a preview of the afternoon session on science in the courtroom by pointing out the difficulty of trying scientific cases in a society with widespread scientific illiteracy. He also discussed the various aspects of his representation of CSICOP and Prometheus Books in a number of court cases involving Uri Geller. At one point in a recent libel case initiated by Geller, VerPloeg said he attempted to require Geller to prove his powers by filing a motion for "compulsory psychic examination." Geller, however, did not take the opportunity to demonstrate his abilities.

Influencing Beliefs in the Courtroom: Rules of Law, Expert Testimony, and Science

Peter Huber, author of *Galileo's Revenge: Junk Science in the Courtroom,* and a member of the Manhattan Institute, opened the session on courtroom science, testimony, and law by citing numerous cases illustrating the problems of determining what qualifies as authentic expert testimony and valid scientific evidence. "How many times are we going to let juries vote on psychic powers?" Huber asked. He said that despite often weak scientific evidence in cases involving dubious claims, the promise of large settlements often brings them into the judicial system. For instance, many suits have been brought against Merrell Pharmaceuticals by women who believed that Bendectin, a drug the company had produced in the 1970s, caused birth defects—in spite of studies of the drug that have consistently produced evidence to the contrary.

Huber discussed how the courts

have historically set standards for scientific evidence and addressed broader conceptions of setting such standards. One philosophy is to "let it all in." This would allow new ideas and discoveries the chance to prove their legitimacy without necessarily first having been widely accepted by the scientific community. On the other hand, "letting it all in" might permit juries to legitimize a wide variety of frivolous claims. Huber said: "There is a real possibility for mischief when false claims of causality are peddled in the courts, and I think we all have a stake in trying to make sure those risks are minimized." Despite his criticism of the court system and past methods of evidence screening, Huber said he has been heartened by recent trends.

Barry Beyerstein, of the Brain Behavior Laboratory at Simon Fraser University, followed with a discussion of graphology. He explained that graphology often appears to work because, as with astrology, subjects read their interpretations and expectations into what are only vague descriptions. By examining the size, shape, style, and proportion of the various loops and angles within handwritten samples, he said, graphologists claim they can ascertain a wide variety of personality traits—from how sexy you are to whether you are a potential pedophile. Beyerstein noted that, despite the lack of scientific evidence establishing graphology as a useful tool, graphologists advise police departments, credit unions, marriage counselors, and employers—and based on this evidence they make important decisions that can profoundly affect people's lives.

Peter Huber discusses past and present courtroom standards for accepting evidence and testimony.

In the criminal-justice system, graphologists have attempted to gain acceptance by aligning themselves with legitimate questioned-document examiners. Beyerstein pointed out that unlike graphologists, these examiners analyze evidence to determine the historical authenticity of a given document, not to look for character traits. Some courts, however, have used graphologists to select jurors, to counsel parole boards, and even to decide the guilt or innocence of defendants. Beyerstein cited one case in which a Denver judge, apparently believing that a change in writing style would produce a change in behavior, made imposing a lighter sentence contingent upon the defendant's signing up for "graphotherapy."

"How many times are we going to let juries vote on psychic powers?"

Gerald M. Rosen, a clinical associate professor of psychology at the University of Washington and moderator of the session, told of a court case involving post-traumatic-stress disorder (PTSD) victims to illustrate how bias effects can operate, particularly among scientists involved with the judicial system. In his research, Rosen compared the information from survivors of a recent Alaskan fishing-boat accident with the data from a similar San Francisco marine accident in 1957, noting that the former occurred after PTSD was established as a genuine disorder. Rosen found that the reported symptoms and diagnoses in the two cases varied substantially. For instance, among the 27 individuals from the San Francisco incident, only 56 percent reported sleep disturbances, while 100 percent of the 20 in the Alaskan accident reported this symptom. Information Rosen had gathered from the original interviews and his own follow-up interviews of the Alaskan victims also revealed interesting facts. One plaintiff admitted that some victims had been coached on symptoms and that others had been instructed to see a doctor because "it would be worth their while."

Rosen believes that there are a number of problems with the way PTSD is being diagnosed, especially in the atmosphere of a court case. Primarily, the litigation can present incentives for victims to exaggerate their ailments. Rosen also said that the criteria for diagnosis of PTSD consist mostly of a list of symptoms, and it is difficult for clinicians to separate actual symptoms from faked ones. Rosen concluded: "Mainstream scientists are still subject to significant bias effects. And when this comes into the courtroom, it can lead to severely compromised results."

Timothy Moore, associate professor of psychology at Glendon College, York University, in Toronto, addressed the problem of "junk science" by discussing his participation in a case involving the heavy-metal band Judas Priest. In the summer of 1990, the band was brought to a Reno, Nevada, court on charges that it had included subliminal messages in its recordings—messages that the plaintiffs said prompted two teenage boys to commit suicide. The defense denied that the band had ever used such messages and further contended that subliminal stimuli are not capable of compelling any behaviors, let alone suicidal ones. However, as Moore pointed out, "The pursuit of isolated, distant, and mysterious causes for various mishaps results in a search for distant and mysterious experts." One of these fringe experts,

Wilson Key, has long been a supporter of the subliminal phenomenon and has claimed to have found subliminal messages in paintings by Michelangelo, in Howard Johnson's menus, and on *both* sides of Nabisco crackers.

Despite the pseudoscientific testimony in support of the plaintiffs, the judge eventually ruled in favor of the defense, and justice would seem to have prevailed. Nevertheless, the decision was not made with a clear understanding of the subliminal phenomenon, Moore said, and the pendulum might have drifted to the side of junk science. He concluded by urging greater scientific literacy on the part of the judicial system.

Conspiracy Theories: Searching for Sense Amid Senselessness

PORTER HENRY

People like to believe in conspiracy theories. These beliefs give them assurance that the world is a logical, predictable place, not some haphazard universe in which a lone kook can assassinate a president and a handful of aluminum foil can be mistaken for remnants of a crashed spaceship.

Conspiracy theories surrounding those two events were dissected at one session of the 1994 CSICOP Conference in Seattle. Phillip J. Klass, noted UFO investigator, analyzed the theory that the government is conspiring to conceal the fact that a spaceship crashed near Roswell, New Mexico, in 1947. Conspiracy theories surrounding the assassination of President John F. Kennedy were examined by Melanie Klein, a student of that event, and Don Kates Jr., attorney and criminologist.

At the time the Roswell wreckage was discovered, Klass pointed out, it was described as about five pounds of light-weight wooden sticks, parchment-like paper, aluminum foil, and an adhesive tape on which flower patterns were printed. True believers in the alien spacecraft theory have interpreted those flowers as extraterrestrial hieroglyphics.

Researcher Robert Todd of Ardmore, Pennsylvania, obtained through the Freedom of Information Act once-secret military documents describing Project Mogul. It involved the use of high-altitude balloons carrying reflectors to beam back radar tracking rays. The reflectors were made of balsa wood, parchment-like paper, and aluminum foil, held together with an adhesive tape.

Todd even located Charles T. Moore, who had participated in Project Mogul. Moore remembered the flower pattern on the tape, explaining that the reflectors had been manufactured in a loft in New York City formerly used for making women's dresses.

After the Army explained, in 1947, that the wreckage was from a reflector, nothing more was heard of the Roswell story until 30 years later. At that time pro-UFO researchers discovered retired Army Major Jesse Marcel, who in 1947 had brought the debris to the Roswell Army Air Base. Marcel now recalled that the foil had been so tough it could not be bent with an 18-pound sledge hammer. Asks Phil Klass: "Why would an Army intelligence officer, given bits of a flying saucer from outer space, attack it with a sledge hammer before turning it over to higher authorities?"

There are two logical reasons, Klass pointed out, for believing that the Army did not, in 1947, find parts of a space vehicle.

1. Coming so soon after Pearl Harbor, the possibility of an invasion from outer space would cause the Army to alert all our military bases and probably those of our Allies. This warning, if known by millions, would have leaked out in days.

2. Ten years later, confronted with the threat of Russian rockets, the U.S. quickly devised an electronic defense to spot flying objects. If the Roswell object had been a possibly threatening vehicle from outer space, such an electronic screen would have been developed at that time.

These insights at the CSICOP symposium came three months before the Air Force issued its report in September identifying a Project Mogul balloon and instruments package as the probable source of the debris found in 1947. (See "Air Force Report on the

UFO researcher Philip Klass reports the findings from his investigation of the Roswell Incident.

Roswell Incident," *SI*, January-February 1995.)

As to the Kennedy assassination, Melanie Klein criticized the reasoning of the true believers in conspiracies, while Don Kates challenged the accuracy of their information.

Melanie Klein examines the reasoning involved in the JFK conspiracy theories.

"The Kennedy assassination," said Klein, "is a simple case of first-degree murder made obscure by the muddled attempts of true believers to solve a nonexistent mystery."

Among their errors in reasoning:

- They violate the principle of Occam's razor—of two theories, choose the simplest—by developing very complicated theories to replace the simple and scientifically based conclusions of the Warren Commission.
- They dismiss the findings of experts, including a Nobel Prize-winner, as being foolish and naive.
- They try to have it both ways. Jim Morrison, in his book *Crossfire*, says that the body buried in Oswald's grave was not really Oswald, so this proves that a conspiracy existed. On the other hand, if the body was Oswald's, this proves it had been substituted for the body buried earlier, so this too proves the conspiracy theory.
- Their theories necessitate the adding of more and more conspirators to their original list. For example, one theory holds that Kennedy's brain would have shown that the bullets came from two different directions, but that a brain showing bullets from one direction was substituted during the flight from Dallas to Washington. But if this were true, Lyndon Johnson and Jackie Kennedy, who were with the body the entire trip, would also have had to be part of the conspiracy.
- They accept the parts of the evidence that support their theories and overlook the rest. Example: they quote witnesses who say the fatal shot came from the grassy knoll rather than the school book depository, ignoring the fact that all these witnesses agree that all shots came from the same direction.

"True believers don't follow the implications of their own claims," she concluded. "There would need to have been hundreds or thousands of conspirators. The belief in a conspiracy may be more intriguing than believing that little old Oswald did it all by himself, but it just doesn't wash. You can't keep that many people quiet for that long."

Conspiracy theories are often based on incorrect information, Don Kates noted. For example, the fact that JFK's head is seen to jerk backwards in the Zapruder film convinces true believers that the shot couldn't have come from behind.

"True believers, like many ordinary people, derive their ideas of what bullets do from Hollywood, where victims are portrayed as being picked up and thrown backwards by the bullet. Bullets cannot do that. If they had that much energy, Newton's law of equal and opposite reaction would mean that the shooter would be knocked backward too.

According to attorney Don Kates, the evidence supporting a JFK conspiracy is weak.

"Shooting victims tend to fall in the direction they were traveling, regardless of where the bullet came from. Sometimes you do have violent body motion, but that is caused by neuromuscular reaction. The body does not go in any particular direction; it simply goes where the neuromuscular reaction dictates."

Oliver Stone's film *JFK* asserted that the bullet would have had to follow a zigzag course to hit both JFK and Governor Connally. "That would be true only if you assume they were sitting straight forward like graven images. If you assume instead that they were acting like politicians, turning and waving to the crowd, they would be lined up perfectly for the shot from the school book depository."

True believers also ask why, if the bullet passed through both men, it was not more distorted. Kates quoted from a standard forensic text, unrelated to the Kennedy assassination: "Full metal jacketed bullets tend to pass through the body intact, thus producing less extensive injuries than hunting ammunition. It is possible for such bullets to pass through more than one individual before coming to rest. These bullets may be almost virginal in appearance after recovery." Actually, the Kennedy bullet showed some deformation.

The most popular assassination theory, espoused in the Oliver Stone film, is that JFK was killed by the military-industrial complex, which feared that he would end the war in Vietnam. Actually, Kates pointed out, JFK resumed nuclear testing, vastly increased military expenditures, believed in the "domino theory"—that surrender in Vietnam would endanger all of southeast Asia—and publicly rejected withdrawal from Vietnam, a point he planned to make in his speech in Dallas the day he was killed.

Recapping the case of Alfred Dreyfus, the French army officer falsely accused in 1894 of being a spy, Kates said the one officer who conspired to plant evidence against him was exposed and punished by other officers.

"In conclusion," he asked, "what drives the true believers? Invincible ignorance and reasoning deficits are symptoms of more basic things. Many people cannot accept the grim truth that tragedies can just happen. Many people can't face the reality that utterly reasonless, unpredictable tragedy may be waiting around every corner. They cast about for some meaningful explanation, something that will make sense of senseless tragedies." □

Science vs. Beauty?

MARTIN GARDNER

My previous column ("Literary Science Blunders," January-February 1995) was about the gulf that too often divides the culture of science from the culture of the liberal arts. Nowhere is this chasm more noticeable than in the lines of certain poets who believe that a knowledge of science somehow destroys one's awareness of the wonders and beauty of nature.

Over the decades I've collected some examples:

The moon shines down with
borrowed light,
So savants say — I do not doubt it.
Suffice its silver trance my sight,
That's all I want to know about it.
A fig for science. . . .

—Robert Service

The goose that laid the golden egg
Died looking up its crotch
To find out how its sphincter
worked.
Would you lay well? Don't watch.

—X. J. Kennedy,
"Ars Poetica"

I'd rather learn from one bird how
to sing
Than teach ten thousand stars how
not to dance.

—e e cummings

While you and i have lips and
voice which
are for kissing and to sing with
who cares if some one eyed son
of a bitch
invents an instrument to measure
Spring with?

—e e cummings

. . . Do not all charms fly
At the mere touch of cold
philosophy?
There was an awful rainbow
once in heaven:
We know her woof, her texture;
she is given
In the dull catalogue of common
things.
Philosophy will clip an Angel's
wings,
Conquer all mysteries by rule and
line,
Empty the haunted air and gnomed
mine—
Unweave a rainbow. . . .

—John Keats, "Lamia"

"Arcturus" is his other name—
I'd rather call him "Star."
It's very mean of Science
To go and interfere!

I pull a flower from the woods—
A monster with a glass
Computes the stamens in a breath
And has her in a "class"!

—Emily Dickinson

A Color stands abroad
On Solitary Fields
That Science cannot overtake
But Human Nature feels.

It waits upon the Lawn,
It shows the furthest Tree
Upon the furthest Slope you
know
It almost speaks to you.

Then as Horizons step
Or Noons report away
Without the Formula of sound
It passes and we stay—

A quality of loss
Affecting our Content
As Trade had suddenly encroached
Upon a Sacrament.

—Emily Dickinson

Sweet is the lore which Nature
brings;
Our meddling intellect
Mis-shapes the beauteous forms of
things:—
We murder to dissect.

Enough of Science and of Art;
Close up those barren leaves;
Come forth, and bring with you a
heart
That watches and receives.

—Wordsworth,
"The Tables Turned"

Today we breathe a commonplace,
Polemic, scientific air;
We strip illusion of her veil;
We vivisect the nightingale
To probe the secret of his note
The Muse in alien ways remote
Goes wandering.

—Thomas Bailey Aldrich

Science! true daughter of Old Time thou art!
Who alterest all things with thy peering eyes.
Why preyest thou thus upon the poet's heart,
Vulture, whose wings are dull realities?

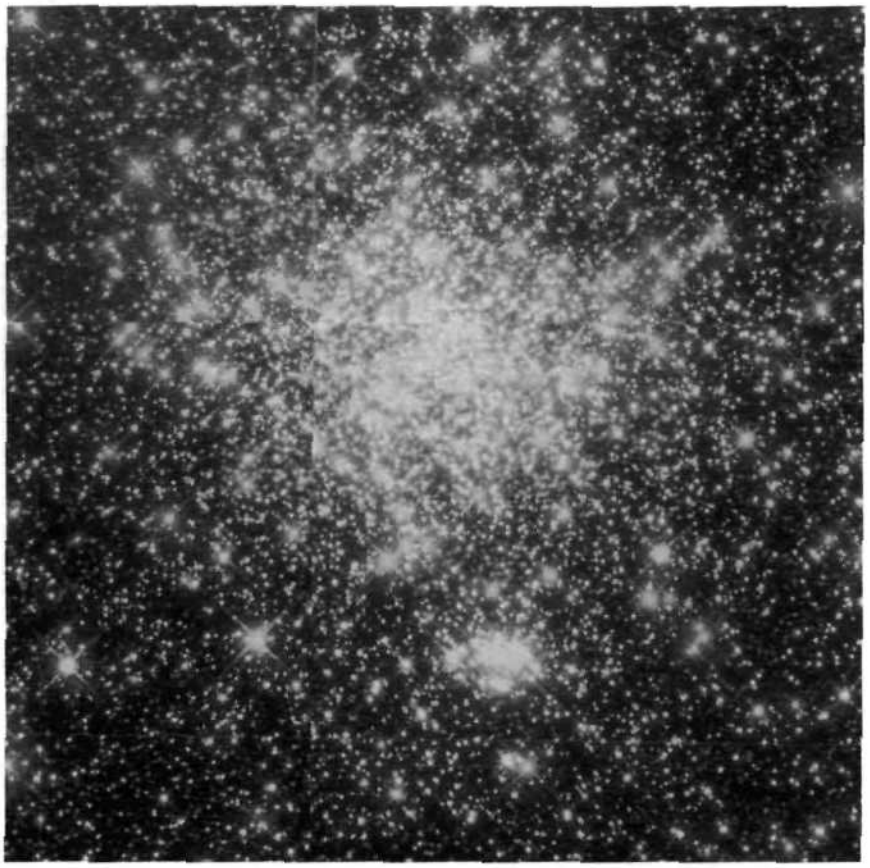
—Edgar Allan Poe

There's machinery in the butterfly,
There's a mainspring to the bee.
There's hydraulics to a daisy
And contraptions to a tree.

If we could see the birdie
That makes the chirping sound
With psycho-analytic eyes,
With X-ray, scientific eyes,
We could see the wheels go round.

And I hope all men
Who think like this
Will soon lie underground.

—Vachel Lindsay



"The vastness of the heavens stretches my imagination," said Richard Feynman. And science continually reveals more cause for wonder. This new Hubble Space Telescope image reveals a concentration of nearly 10,000 stars in a pair of star clusters 166,000 light-years away in the Large Magellanic Cloud. Previously such rich detail was seen only in star birth regions in our own galaxy, but Hubble extends studies of the birth and evolution of stars a hundred times farther into the universe. (Photo: NASA Space Telecope Science Institute)

Similar sentiments have been expressed in prose. Here are a few: Coleridge: "The real antithesis of poetry is not prose but science." Billy Rose: "I wish the engineers would keep their slide rules out of the bits of fairyland left in this bollixed up world." Nietzsche: "They [scientists] have cold, withered eyes before which all birds are unplumed."

There is something to be said for such sentiment, though not much. It is possible for scientists to become so *wrapped up in their work that they* lose all sense of nature's beauty and mystery. "When you understand all about the sun and all about the atmosphere and all about the rotation of the earth," wrote Alfred North Whitehead, a philosopher who stood astride the two cultures, "you may still miss the radiance of the sunset."

G. K. Chesterton made the same point in his amusing story "The Unthinkable Theory of Professor Green," in *Tales of the Long Bow*. Green is an astronomer who forgot about the world around him until one day when he *fell in love with a farmer's daughter.* He announces a lecture on his discovery of a new planet. The auditorium is *packed with colleagues while he de*scribes one of the planet's strange creatures. Slowly it dawns on Green's listeners *that he is describing a cow.*

I suppose that scientists like Professor Green, before he discovered the earth, exist, but if so, I have yet to encounter one. On the contrary, almost all scientists believe that as their knowledge increases, their sense of wonder also grows. The scientist sees a flower, said physicist John Tyndall, "with a wonder superadded."

Professor Green's unthinkable theory reminds me of stanza xcii from the first canto of Byron's *Don Juan*:

He thought about himself, and the whole earth,
Of man the wonderful, and of the stars,
And how the deuce they ever could have birth;
[illegible]
quakes, and of wars,
How many miles the moon might have in girth,
Of air-balloons, and of the many bars
To perfect knowledge of the boundless skies;—
And then he thought of Donna Julia's eyes.

The Laputans, in *Gulliver's Travels,* describe a woman's beauty by "rhombs, circles, parallelograms, ellipses, and other geometrical terms." Arthur S. Eddington, writing on "Science and Mysticism" in *The Nature of the Physical World,* quotes from a page on winds and waves in a textbook on hydrodynamics. He then compares this with the aesthetic experience of watching actual sea waves "dancing in the sunshine."

That knowledge of science adds to one's appreciation of the mystery and splendor of the cosmos has nowhere been more vigorously expressed than by the late physicist Richard Feynman, in Christopher Syke's *No Ordinary Genius* (W. W. Norton, 1994). He described an artist friend who would hold up a flower and say: "I, as an artist, can see how beautiful a flower is. But you, as a scientist, take it all apart and it becomes dull."

"I think he's kind of nutty," says Feynman, and he adds:

> First of all, the beauty he sees is available to other people—and to me too. Although I might not be quite as refined aesthetically as he is, I can appreciate the beauty of a flower.
>
> At the same time, I see much more about the flower than he sees. I could imagine the cells in there, the complicated actions inside, which also have a beauty. I mean, it's not just beauty at this dimension of one centimeter: there is also beauty at a smaller dimension—the inner structure. The fact that the colors in the flower are evolved in order to attract insects to pollinate it is interesting—it means that the insects can see the color. It adds a question: does this aesthetic sense also exist in the lower forms? Why is it aesthetic? All kinds of interesting questions which a science knowledge only adds to the excitement and mystery and the awe of a flower. It only adds. I don't understand how it subtracts.
>
> Does it make any less of a beautiful smell of violets to know that it's molecules? To find out, for example, that the smell of violets is very similar to the chemical that's used by a certain butterfly (I don't know whether it's true, like my father's stories!), a butterfly that lets out this chemical to attract all its mates? It turns out that this chemical is exactly the smell of violets with a small change of a few molecules. The different kinds of smells and the different kinds of chemicals, the great variety of chemicals and colors and dyes and so on in the plants and everywhere else, are all very closely related, with very small changes, and the efficiency of life is not always to make a new thing, but to modify only slightly something that's already there, and make its function entirely different, so that the smell of violets is related to the smell of earth. . . . These are all additional facts, additional discoveries. It doesn't take away that it can't answer questions of what, ultimately, does the smell of violets really feel like when you smell it. That's only if you expected science to give the answers to every possible question. But the idea that science takes away is something I don't understand.
>
> It's true that technology can have an effect on art that might be a kind of subtraction. For example, in the early days painting was to make pictures when pictures were unavailable, that was one reason: it was very useful to give people pictures to look at, to help them think about God, or the Annunciation, or whatever. When photography came as a result of technology, which itself was the result of scientific knowledge, then that made pictures very much more available. The care and effort needed to make something by hand which looked exactly like nature and which was once such a delight to see now became mundane in a way (although of course there's a new art—the art of taking good pictures). So yes, technology can have an effect on art, but the idea that it takes away mystery or awe or wonder in nature is wrong. It's quite the opposite. It's much more wonderful to know what something's really like than to sit there and just simply, in ignorance, say, "Oooh, isn't it wonderful!"

A famous poem by Walt Whitman tells how he listened to a "learn'd astronomer" lecture about the heavens until he (Walt) became "unaccountably tired and sick." He walks out of the lecture room into the "mystical moist night air" so he can look up "in perfect silence at the stars."

Here is how Feynman, in his *Lectures on Physics,* reacted to the notion that astronomical knowledge dulls one's sense of awe toward the cosmos:

> "The stars are made of the same atoms as the earth." I usually pick one small topic like this to give a lecture on. Poets say science takes away from the beauty of the stars—mere gobs of gas atoms. Nothing is "mere." I too can see the stars on a desert night, and feel them. But do I see less or more? The vastness of the heavens stretches my imagination—stuck on this carousel my little eye can catch one-million-year-old light. A vast pattern—of which I am a part—perhaps my stuff was belched from some forgotten star, as one is belching there. Or see them with the greater eye of Palomar, rushing all apart from some common starting point when they were perhaps all together. What is the pattern, or the meaning, or the *why?* It does not do harm to the mystery to know a little about it. For far more marvelous is the truth than any artists of the past imagined! Why do the poets of the present not speak of it? What men are poets who can speak of Jupiter if he were like a man, but if he is an immense spinning sphere of methane and ammonia must be silent?

Isaac Asimov, writing on "Science and Beauty" in *The Roving Mind,* quotes Whitman's poem. "The trouble is that Whitman is talking through his hat," says Asimov. Of course the night sky is beautiful, but is there not a deeper, added beauty provided by astronomy? Asimov continues with lyrical paragraphs about the "weird and unearthly beauty" of our sister planets,

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The Year the World Would End, and Other Prognostications

ROBERT SHEAFFER

The police arrested the wrong suspect for the murders of Nicole Brown Simpson and Ronald Goldman, according to one well-known "psychic." John Monti, of Long Island, New York, told the tabloid paper *The Star* (November 22, 1994) that the victims were murdered not by O. J. Simpson, but by a gang of three, led by a woman. The three then traveled to O. J. Simpson's estate, where they planted the evidence that implicated him. Monti claims to have gone to the murder scene, where he "evaded police and climbed over the fence into Nicole's garden—and had a psychic vision about the murders as he stood in the dried blood of the two victims." His psychic powers, Monti says, enabled him to retrieve the knife used to murder Goldman, which he displayed on the set of Sally Jessy Raphael's TV show. He realizes that this confession opens him up to possible prosecution for "evidence tampering," but he hopes that his claim of seeing the location of the knife used to kill the other victim will convince prosecutors to let him help find it. Thus far, it hasn't.

However, one's confidence in Monti's visions is dampened by the record of his previous published predictions. He predicted that Princess Fergie would pose naked for *Playboy* in 1993 and that a cure for AIDS would be found in crabgrass. Health problems would force Fidel Castro out of office during 1991, and Ted Kennedy would announce plans to marry Donna Rice in 1989.

While we're on the subject of predictions, Jeane Dixon gave us her prognostication for the O. J. Simpson trial. She predicted in *The Star* (October 11, 1994) that "a bitter dispute will erupt among O. J. Simpson's lawyers during his trial, when one wants O. J. to change his plea to guilty [*sic*] by reason of insanity," and that Simpson "faces a long period of incarceration—until at least 1999." However, she fails to specify the actual outcome of the trial, which leaves open many possibilities. Dixon also predicted for last fall that "scientists will learn to their surprise that the secret locations of undersea treasures have been passed on from generation to generation—by dolphins and porpoises."

Nineteen ninety-four was a great year for the world ending. Indeed, the world was to end more times in 1994 than in any other year in recent memory. Harold Camping, president and general manager of a 39-station network of religious radio broadcasters, proclaimed that before the end of September 1994 the dead would be rising from their graves for their final judgment. Camping explained to the *San Jose Mercury News* (September 4, 1994) that he had arrived at his prediction by a laborious and careful process of counting off significant dates in the Bible. Furthermore, his math has been checked by a nuclear physicist and "a number of scientists at the Lawrence Livermore lab," as if errors in arithmetic were the only way such a prediction might go awry. Mainstream religious scholars, of course, suggested Camping was seriously mistaken. Fortunately, Camping exhorted his listeners: "Don't do anything bizarre. Just live the way you should have been living all the time." His stations are still on the air and seem to have found something else to talk about.

June 9, 1994, was another date on which the world was to end. Various fundamentalist prognosticators somehow settled upon that date and started warning ominously that "June 9th is coming," the day on which God would supposedly "rip sin out of the world." Warnings were issued for a major destructive earthquake somewhere along the Pacific "ring of fire," supposedly only the first event in an eschatological progression. So widespread was the expectation that it was even mentioned on TV's "700 Club," although with the clear disclaimer that it would not be the start of the Rapture. When a large but very deep earthquake, which caused little or no

Prognostications continued on page 55

Paranormal and Paranoia Intermingle on Fox TV's 'X-Files'

C. EUGENE EMERY, JR.

"The Truth Is Out There" may be the slogan for "The X-Files," but all too often truth takes a holiday on this television series on the Fox network.

"The X-Files" is the story of FBI agents Fox Mulder, a hard-core student of the paranormal, and partner Dana Scully, a physician and self-avowed skeptic. The pair specialize in investigating otherworldly phenomena, such as space aliens hidden by the government, a werewolf stalking the city, and an astronaut haunted by the face on Mars.

Blocking their path is a seemingly endless array of shadowy government operatives and local police officials intent on preventing knowledge of these paranormal events from escaping into the public realm. Even one of Mulder's most trusted sources, who actually seemed to know what the government is *really* up to, appeared to harbor a secret agenda, sending the agents scurrying after a solid lead one minute and chasing down a blind alley the next. (True to form, the "Deep Throat" character was gunned down at the end of the first season.)

It's this ominous mix of the paranormal and the paranoid that gives "The X-Files" its edge and has fueled its popularity.

Let's pause for a moment for this reality check: "The X-Files" is fiction. It's a program that appeals to fans of "The Twilight Zone" with its ability to creatively extrapolate the plausible and make the impossible seem possible. That's what good science fiction does. As fiction, "The X-Files" is immune from the fact-based criticism that can be leveled against "reality-based" shows like "In Search of . . ." and "Sightings," programs that play fast and loose with reality.

Nonetheless, some elements of "The X-Files" may be of interest to people who truly want to uncover the secrets of UFOs, psychic phenomena, and things that go bump in the night.

The best science fiction builds on real science because science provides a foundation that makes it easier for viewers to suspend their disbelief. Underlying "X-Files" stories is the suggestion—sometimes explicit, sometimes implicit—that these tales are based on real-life events. *TV Guide,* for one, bought into the fiction-based-on-fact illusion, saying the program offered "intelligent, balanced treatment of subjects usually reserved for the *Weekly World News.*"

The first show began with the message, "The following story is inspired by actual documented accounts," and then proceeded to spin a story of alien abductions that included implanted objects in nasal cavities, mysterious nosebleeds, and human-alien hybrids, all incidents whose real-life "documentation" is highly questionable. (This introduction disappeared after the first episode.)

Scratch the surface of "The X-Files" and you'll find, not surprisingly, that too many episodes don't even have their basis in real science. In the pilot, Scully the skeptic, who supposedly earned an undergraduate degree in physics, reacts to Mulder's claim that the pair have had an episode of missing time by declaring: "Time can't just disappear. It's a universal invariant." Wrong. The speed of light is the universal invariant. Experiment after experiment has shown that the faster you travel, the slower time passes relative to someone else. The episode on spontaneous human combustion mentioned fifth- and sixth-degree burns, a classification that doesn't exist in any medical textbook I've seen.

There are other reasons to suspect that the supermarket tabloids are the only source of "scientific" information for the show. In the program where an FBI agent and a ruthless killer have simultaneous near-death experiences, allowing the fatally wounded killer to transfer his psyche into the body of the FBI agent, the series shows a University of Maryland biologist declaring: "Did you know that half of all the adults

who have had a near-death experience cannot wear a watch? The increased electrical activity in their bodies renders the watches on their wrists inoperative." If that were true, it would be a real piece of hard evidence that NDEs reflect an extraordinary phenomenon, something real scientists could test and probe. If the alleged wristwatch phenomenon was important to the story line, its presentation as fact would be excusable. But it's not. It was extraneous poppycock created to give the characters something to talk about during the epilogue.

The show fares no better when it deals with skepticism. The attitude of Scully, supposedly the down-to-earth "skeptic," is dismissive, not skeptical. Good skeptics can cite evidence to explain why they are suspicious of a report of an extraordinary phenomenon. Scully usually can't. Her closed-mindedness is obvious when a death-row psychic demonstrates his power. "I'm afraid to believe," she confessed to Mulder. But she should believe. In the world of "The X-Files," hoaxes are rare, psychic phenomena really exist, people can transform themselves into animals, UFOs are abducting innocent people, and a man can turn himself into a human torch. If I'd seen half the stuff Scully did during the first season of shows, my skepticism would have dissolved by the first commercial break.

"The X-Files" does have some redeeming moments. When Mulder and Scully are trying to track down a space alien that is being (inexplicably) transported via truck across the country, Mulder looks at photographs of an alleged UFO and comments that he quickly spotted the Gulf Breeze UFO photographs as hoaxes. When Bigfoot-type creatures are found in the New Jersey woods outside Atlantic City, an autopsy shows that the man and woman are *Homo sapiens*, not missing links.

And when the pair are trying to find a kidnapped couple using the death-row psychic, Mulder removes a blue piece of cloth from a sealed evidence bag, listens to the psychic's grisly impressions of the crime, and reveals, "I tore this off my New York Knicks T-shirt. It has nothing to do with the crime."

The incident with the psychic, in particular, showed reason for optimism about "The X-Files" because that's how a good investigator does the job.

In the end, Mulder and Scully may be good role models for people interested in the occult because they're shown investigating the supernatural firsthand, willing to probe the facts to see what's really going on, and unwilling to accept paranormal explanations until the other possibilities have been ruled out. If only real-life "investigators" of the supernatural did the same, instead of relying on shoddy research, ignorance, and exaggerated claims.

I've seen too many cases where people don't know, don't want to know, or don't want to tell others about prosaic explanations for seemingly strange phenomena.

The truth *is* out there. But the hoaxers and charlatans, along with the staunch believers who are loath to expose them, do more to undermine credible research in these fields than any government disinformation campaign ever could. It would be nice—and perhaps even entertaining—if "The X-Files" spent a little more time focusing on their stories. Folks fascinated by the supernatural would get a better taste of the truth. □

Michael Grecco/FOX

Agents Fox Mulder (David Duchovny) and Dana Scully (Gillian Anderson) search for explanations for the strange phenomena they encounter on the "X-Files."

Gene Emery is the science writer for the Providence Journal, *75 Fountain St., Providence, RI 02902.*

Remembering Dangerously

ELIZABETH LOFTUS

Like the witch-hunt trials of old, people today are being accused and even imprisoned on 'evidence' provided by memories from dreams and flashbacks—memories that didn't exist before therapy. What is going on here?

We live in a strange and precarious time that resembles at its heart the hysteria and superstitious fervor of the witch trials of the sixteenth and seventeenth centuries. Men and women are being accused, tried, and convicted with no proof or evidence of guilt other than the word of the accuser. Even when the accusations involve numerous perpetrators, inflicting grievous wounds over many years, even decades, the accuser's pointing finger of blame is enough to make believers of judges and juries. Individuals are being imprisoned on the "evidence" provided by memories that come back in dreams and flashbacks—memories that did not exist until a person wandered into therapy and was asked point-blank, "Were you ever sexually abused as a child?" And then begins the process of excavating the "repressed" memories through invasive therapeutic techniques, such

as age regression, guided visualization, trance writing, dream work, body work, and hypnosis.

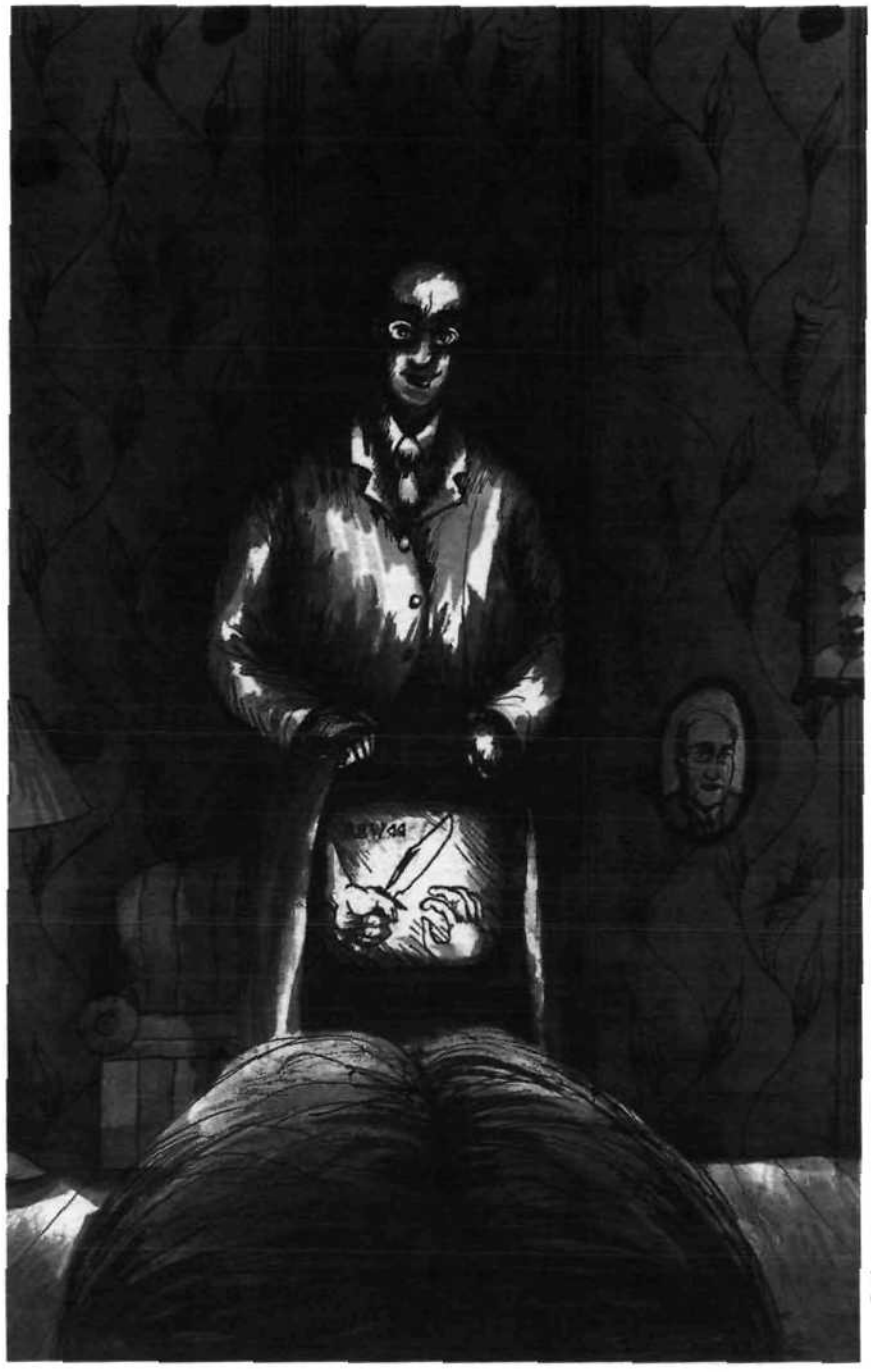
One case that seems to fit the mold led to highly bizarre satanic-abuse memories. An account of the case is described in detail by one of the expert witnesses (Rogers 1992) and is briefly reviewed by Loftus and Ketcham (1994).

A woman in her mid-seventies and her recently deceased husband were accused by their two adult daughters of rape, sodomy, forced oral sex, torture by electric shock, and the ritualistic murder of babies. The older daughter, 48 years old at the time of the lawsuit, testified that she was abused from infancy until age 25. The younger daughter alleged abuse from infancy to age 15. A granddaughter also claimed that she was abused by her grandmother from infancy to age 8.

The memories were recovered when the adult daughters went into therapy in 1987 and 1988. After the breakup of her third marriage, the older daughter started psychotherapy, eventually diagnosing herself as a victim of multiple-personality disorder and satanic ritual abuse. She convinced her sister and her niece to begin therapy and joined in their therapy sessions for the first year. The two sisters also attended group therapy with other multiple-personality-disorder patients who claimed to be victims of satanic ritual abuse.

In therapy the older sister recalled a horrifying incident that occurred when she was four or five years old. Her mother caught a rabbit, chopped off one of its ears, smeared the blood over her body, and then handed the knife to her, expecting her to kill the animal. When she refused, her mother poured scalding water over her arms. When she was 13 and her sister was still in diapers, a group of Satanists demanded that the sisters disembowel a dog with a knife. She remembered being forced to watch as a man who threatened to divulge the secrets of the cult was burned with a torch. Other members of the cult were subjected to electric shocks in rituals that took place in a cave. The cult even made her murder her own newborn baby. When asked for more details about these horrific events, she testified in court that her memory was impaired because she was frequently drugged by the cult members.

The younger sister remembered being molested on a piano bench by her father while his friends watched. One recalled being impregnated by members of the cult at ages 14 and 16, and both pregnancies were ritually aborted. She remembered one incident in the library where she had to eat a jar of pus and another jar of scabs. Her daughter remembered seeing her grandmother in a black robe carrying a candle and being drugged on two occasions and forced to ride in a limousine



Patrick Huberthal

Elizabeth F. Loftus is in the Department of Psychology, University of Washington, Seattle, WA 98195. This article is based on a paper given at the 1994 CSICOP Conference.

with several prostitutes.

The jury found the accused woman guilty of neglect. It did not find any intent to harm and thus refused to award monetary damages. Attempts to appeal the decision have failed.

"The infancy memories are almost certainly false memories given the scientific literature on childhood amnesia."

Are the women's memories authentic? The "infancy" memories are almost certainly false memories given the scientific literature on childhood amnesia. Moreover, no evidence in the form of bones or dead bodies was ever produced that might have corroborated the human-sacrifice memories. If these memories are indeed false, as they appear to be, where would they come from? George Ganaway, a clinical assistant professor of psychiatry at the Emory University School of Medicine, has proposed that unwitting suggestions from therapy play an important role in the development of false satanic memories.

What Goes on in Therapy?

Since therapy is done in private, it is not particularly easy to find out what really goes on behind that closed door. But there are clues that can be derived from various sources. Therapists' accounts, patients' accounts, and sworn statements from litigation have revealed that highly suggestive techniques go on in some therapists' offices (Lindsay and Read 1994; Loftus 1993; Yapko 1994).

Other evidence of misguided if not reckless beliefs and practices comes from several cases in which private investigators, posing as patients, have gone undercover into therapists' offices. In one case, the pseudopatient visited the therapist complaining about nightmares and trouble sleeping. On the third visit to the therapist, the investigator was told that she was an incest survivor (Loftus 1993). In another case, Cable News Network (CNN 1993) sent an employee undercover to the offices of an Ohio psychotherapist (who was supervised by a psychologist) wired with a hidden video camera. The pseudopatient complained of feeling depressed and having recent relationship problems with her husband. In the first session, the therapist diagnosed "incest survivor," telling the pseudopatient she was a "classic case." When the pseudopatient returned for her second session, puzzled about her lack of memory, the therapist told her that her reaction was typical and that she had repressed the memory because the trauma was so awful. A third case, based on surreptitious recordings of a therapist from the Southwestern region of the United States, was inspired by the previous efforts.

Inside a Southwestern Therapist's Office

In the summer of 1993, a woman (call her "Willa") had a serious problem. Her older sister, a struggling artist, had a dream that she reported to her therapist. The dream got interpreted as evidence of a history of sexual abuse. Ultimately the sister confronted the parents in a videotaped session at the therapist's office. The parents were mortified; the family was wrenched irreparably apart.

Willa tried desperately to find out more about the sister's therapy. On her own initiative, Willa hired a private investigator to pose as a patient and seek therapy from the sister's therapist. The private investigator called herself Ruth. She twice visited the therapist, an M.A. in counseling and guidance who was supervised by a Ph.D., and secretly tape-recorded both of the sessions.

In the first session, Ruth told the therapist that she had been rear-ended in an auto accident a few months earlier and was having trouble getting over it. Ruth said that she would just sit for weeks and cry for no apparent reason. The therapist seemed totally disinterested in getting any history regarding the accident, but instead wanted to talk about Ruth's childhood. While discussing her early life, Ruth volunteered a recurring dream that she had had in childhood and said the dream had now returned. In the dream she is 4 or 5 years old and there is a massive white bull after her that catches her and gores her somewhere in the upper thigh area, leaving her covered with blood.

The therapist decided that the stress and sadness that Ruth was currently experiencing was tied to her childhood, since she'd had the same dream as a child. She decided the "night terrors" (as she called them) were evidence that Ruth was suffering from post-traumatic-stress disorder (PTSD). They would use guided imagery to find the source of the childhood trauma. Before actually launching this approach, the therapist informed her patient that she, the therapist, was an incest survivor: "I was incested by my grandfather."

During the guided imagery, Ruth was asked to imagine herself as a little child. She then talked about the trauma of her parents' divorce and of her father's remarriage to a younger woman who resembled Ruth herself. The therapist wanted to know if Ruth's father had had affairs, and she told Ruth that hers had, and that this was a "generational" thing that came from the grandfathers. The therapist led Ruth through confusing/suggestive/ manipulative imagery involving a man holding down a little girl somewhere in a bedroom. The therapist decided that Ruth was suffering from a "major grief issue" and told her it was sexual: "I don't think, with the imagery and his marrying someone who looks like you, that it could be anything else."

The second session, two days later, began:

Pseudopatient: You think I am quite

possibly a victim of sexual abuse?

Therapist: Um-huh. Quite possibly. It's how I would put it. You know, you don't have the real definitive data that says that, but, um, the first thing that made me think about that was the blood on your thighs. You know, I just wonder, like where would that come from in a child's reality. And, um, the fact that in the imagery the child took you or the child showed you the bedroom and your father holding you down in the bedroom . . . it would be really hard for me to think otherwise. . . . Something would have to come up in your work to really prove that it really wasn't about sexual abuse.

Ruth said she had no memory of such abuse but that didn't dissuade the therapist for a minute.

Pseudopatient: . . . I can remember a lot of anger and fear associated with him, but I can't recall physical sexual abuse. Do people always remember?

Therapist: No. . . . Hardly ever. . . . It happened to you a long time ago and your body holds on to the memory and that's why being in something like a car *accident might trigger memo*ries. . . .

The therapist shared her own experiences of abuse, now by her father, which supposedly led to anorexia, bulimia, overspending, excessive drinking, and other destructive behaviors from which the therapist had presumably now recovered. For long sections of the tape it was hard to tell who was the patient and who was the therapist.

Later the therapist offered these bits of wisdom:

I don't know how many people I think are really in psychiatric hospitals who are really just incest survivors or, um, have repressed memories.

It will be a grief issue that your father was—sexualized you—and was not an appropriate father.

You need to take that image of yourself as an infant, with the hand over, somebody's trying to stifle your crying, and feeling pain somewhere as a memory.

The therapist encouraged Ruth to read two books: *The Courage To Heal,* which she called the "bible of healing from childhood sexual abuse," and the workbook that goes with it. She made a special point of talking about the section on confrontation with the perpetrator. Confrontation, she said, wasn't necessarily for everyone. Some don't want to do it if it will jeopardize their inheritance, in which case, the therapist said, you can do it after the person is dead—you can do eulogies. But confrontation is empowering, she told Ruth.

Then to Ruth's surprise, the therapist described the recent confrontation she had done with Willa's sister (providing sufficient detail about the unnamed patient that there could be little doubt about who it was).

Therapist: I just worked with someone who did do it with her parents. Called both of her parents in and we did it in here. . . . Its empowering because you're stepping out on your own. She said she felt like she was 21, and going out on her own for the first time, you know, that's what she felt like. . . .

Pseudopatient: And, did her parents deny or—

Therapist: Oh, they certainly did—

Pseudopatient: Did she remember, that she—she wasn't groping like me?

Therapist: She groped a lot in the beginning. But it sort of, you know, just like pieces of a puzzle, you know, you start to get them and then eventually you can make a picture with it. And she was able to do that. And memory is a funny thing. It's not always really accurate in terms of ages, and times and places and that kind of thing. Like you may have any variable superimposed on another. Like I have a friend who had an ongoing sexual abuse and she would have a memory of, say, being on this couch when she was seven and being abused there, but they didn't have that couch when she was seven, they had it when she was five. . . . It doesn't discount the memory, it just means that it probably went on more than once and so those memories overlap. . . .

Pseudopatient: This woman who did the confrontation, is she free now? Does she feel freed over it?

Therapist: Well, she doesn't feel free from her history . . . but she does feel like she owns it now and it doesn't own her . . . and she has gotten another memory since the confrontation. . . .

The therapist told Ruth all about the "new memory" of her other patient, Willa's sister:

Therapist: [It was in] the early-morning hours and she was just lying awake, and she started just having this feeling of, it was like her hands became uncontrollable and it was like she was masturbating someone. She was like going faster than she could have, even in real life, so that she knew, it was familiar enough to her as it will be to you, that she knew what it was, and it really did not

"We live in a culture of accusations. When it comes to molestation, the accused is almost always considered guilty as charged."

> freak her out at all. . . . She knew there was a memory there she was sitting on.

Before Ruth's second therapy session had ended, Ruth's mother was brought into the picture—guilty, at least, of betrayal by neglect:

> Therapist: Well, you don't have to have rational reasons, either, to feel betrayed. The only thing that a child needs to feel is that there was probably a part of you that was just yearning for your mother and that she wasn't there. And whether she wasn't there because she didn't know and was off doing something else, or whether she was there and she knew and she didn't do anything about it. It doesn't matter. All the child knew was that Mom wasn't there. And, in that way she was betrayed, you know, whether it was through imperfection on your mother's part or not, and you have to give yourself permission to feel that way without justification, or without rationalization because you were.

Ruth tried again to broach the subject of imagination versus memory:

> Pseudopatient: How do we know, when the memories come, what are symbols, that it's not our imagination or something?
>
> Therapist: Why would you image this, of all things. If it were your imagination, you'd be imaging how warm and loving he was. . . . I have a therapist friend who says that the only proof she needs to know that something happened is if you think it might have.

At the doorway as Ruth was leaving, her therapist asked if she could hug her, then did so while telling Ruth how brave she was. A few weeks later, Ruth got a bill. She was charged $65 for each session.

Rabinowitz (1993) put it well: "The beauty of the repressed incest explanation is that, to enjoy its victim benefits, and the distinction of being associated with a survivor group, it isn't even necessary to have any recollection that such abuse took place." Actually, being a victim of abuse without any memories does not sit well, especially when group therapy comes into play and women without memories interact with those who do have memories. The pressure to find memories can be very great.

"Why at this time in our society is there so much interest in 'repression' and the uncovering of repressed memories?"

Chu (1992:7) pointed out one of the dangers of pursuing a fruitless search (for memories): it masks the real issues from therapeutic exploration. Sometimes patients produce "ever more grotesque and increasingly unbelievable stories in an effort to discredit the material and break the cycle. Unfortunately, some therapists can't take the hint!"

The Southwestern therapist who treated Ruth diagnosed sexual trauma in the first session. She pursued her sex-abuse agenda in the questions she asked, in the answers she interpreted, in the way she discussed dreams, in the books she recommended. An important question remains as to how common these activities might be. Some clinicians would like to believe that the problem of overzealous psychotherapists is on a "very small" scale (Cronin 1994: 31). A recent survey of doctoral-level psychologists indicates that as many as a quarter may harbor beliefs and engage in practices that are questionable (Poole and Lindsay 1994). That these kinds of activities can and do sometimes lead to false memories seems now to be beyond dispute (Goldstein and Farmer 1993). That these kinds of activities can create false victims, as well as hurt true ones, also seems now to be beyond dispute.

The Place of Repressed Memories in Modern Society

Why at this time in our society is there such an interest in "repression" and the uncovering of repressed memories? Why is it that almost everyone you talk to either knows someone with a "repressed memory" or knows someone who's being accused, or is just plain interested in the issue? Why do so many individuals believe these stories, even the more bizarre, outlandish, and outrageous ones? Why is the cry of "witch hunt" now so loud (Baker 1992: 48; Gardner 1991)? *Witch hunt* is, of course, a term that gets used by lots of people who have been faced by a pack of accusers (Watson 1992).

"Witch hunt" stems from an analogy between the current allegations and the witch-craze of the sixteenth and seventeenth centuries, an analogy that several analysts have drawn (McHugh 1992; Trott 1991; Victor 1991). As the preeminent British historian Hugh Trevor-Roper (1967) has noted, the European witch-craze was a perplexing phenomenon. By some estimates, a half-million people were convicted of witchcraft and burned to death in Europe alone between the fifteenth and seventeenth centuries (Harris 1974: 207-258). How did this happen?

It is a dazzling experience to step back in time, as Trevor-Roper guides his readers, first to the eighth century, when the belief in witches was thought to be "unchristian" and in some places the death penalty was decreed for anyone who burnt supposed witches. In the ninth century, almost no one believed that witches could make bad weather, and almost everyone believed that night-flying was a hallucination. But by the beginning of the sixteenth century, there was a complete reversal of these views. "The monks of the late Middle Ages sowed: the lawyers of the sixteenth century reaped; and what a harvest of witches they gathered in!" (Trever-Roper 1967: 93). Countries that had never known witches were now found to be swarming with them. Thousands of old women (and some young ones) began confessing to being

witches who had made secret pacts with the Devil. At night, they said, they anointed themselves with "devil's grease" (made from the fat of murdered infants), and thus lubricated they slipped up chimneys, mounted broomsticks, and flew off on long journeys to a rendezvous called the witches' sabbat. Once they reached the sabbat, they saw their friends and neighbors all worshipping the Devil himself. The Devil sometimes appeared as a big, black, bearded man, sometimes as a stinking goat, and sometimes as a great toad. However he looked, the witches threw themselves into promiscuous sexual orgies with him. While the story might vary from witch to witch, at the core was the Devil, and the witches were thought to be his earth agents in the struggle for control of the spiritual world.

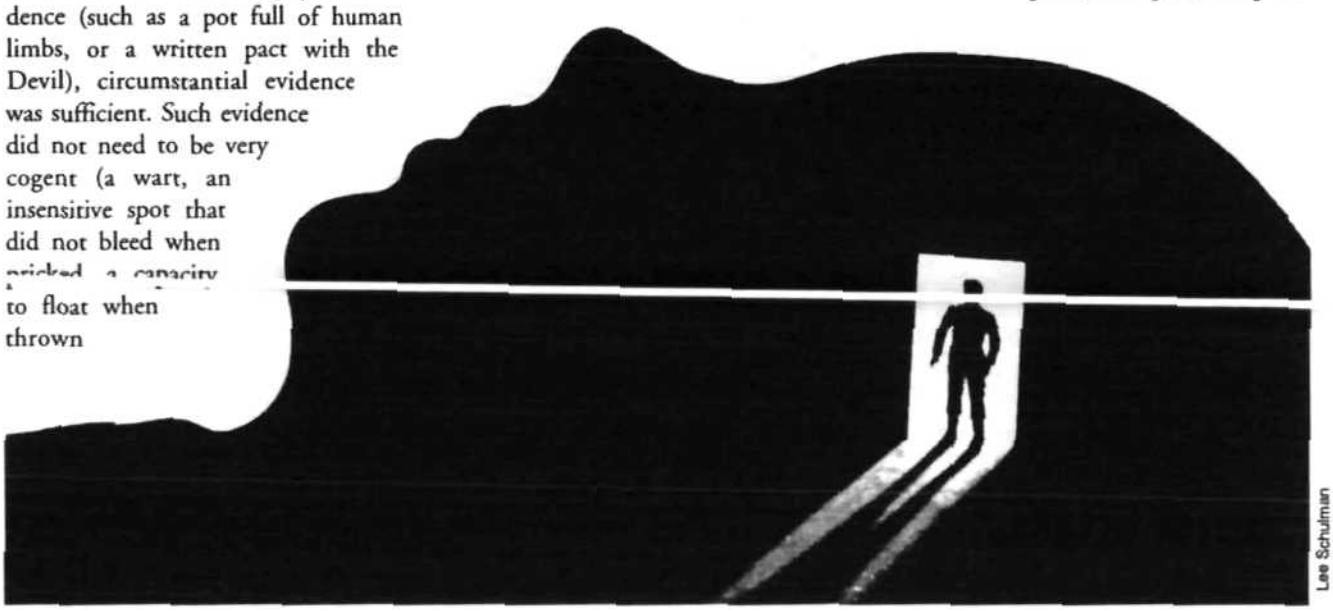
Throughout the sixteenth century, people believed in the general theory, even if they did not accept all of the esoteric details. For two centuries, the clergy preached against the witches. Lawyers sentenced them. Books and sermons warned of their danger. Torture was used to extract confessions. The agents of Satan were soon found to be everywhere. Skeptics, whether in universities, in judges' seats, or on the royal throne, were denounced as witches themselves, and joined the old women at the burning stake. In the absence of physical evidence (such as a pot full of human limbs, or a written pact with the Devil), circumstantial evidence was sufficient. Such evidence did not need to be very cogent (a wart, an insensitive spot that did not bleed when pricked, a capacity to float when thrown in water, an incapacity to shed tears, a tendency to look down when accused). Any of these "indicia" might justify the use of torture to produce a confession (which was proof) or the refusal to confess (which was also proof) and justified even more ferocious tortures and ultimately death.

When did it end? In the middle of the seventeenth century the basis of the craze began to dissolve. As Trevor-Roper (1967: 97) put it, "The rubbish of the human mind, which for two centuries, by some process of intellectual alchemy and social pressure, had become fused together in a coherent, explosive system, has disintegrated. It is rubbish again."

Various interpretations of this period in social history can be found. Trevor-Roper argued that during periods of intolerance any society looks for scapegoats. For the Catholic church of that period, and in particular their most active members, the Dominicans, the witches were perfect as scapegoats; and so, with relentless propaganda, they created a hatred of witches. The first individuals to be so labeled were the innocently nonconforming social groups. Sometimes they were induced to confess by torture too terrible to bear (e.g., the "leg screw" squeezed the calf and broke the shinbone in pieces; the "lift" hoisted the arms fiercely behind and back; the "ram" or "witch-chair" provided a heated seat of spikes for the witch to sit on). But sometimes confessions came about spontaneously, making their truth even more convincing to others. Gradually laws changed to meet the growth of witches—including laws permitting judicial torture.

There were skeptics, but many of them did not survive. Generally they tried to question the plausibility of the confessions, or the efficacy of torture, or the identification of particular witches. They had little impact, Trevor-Roper claims, because they danced around the edges rather than tackling the core: the concept of Satan. With the mythology intact, it creates its own evidence that is very difficult to disprove. So how did the mythology that had lasted for two centuries lose its force? Finally, challenges against the whole idea of Satan's kingdom were launched. The stereotype of the witch would soon be gone, but not before tens of thousands of witches had been burned or hanged, or both (Watson 1992).

Trevor-Roper saw the witch-craze as a social movement, but with individual extensions. Witch accusations could be used to destroy powerful enemies or dangerous persons. When a "great fear" grips a society, that society looks to the stereotype of the enemy in its midst and points the finger of accusation. In times of panic, he argued, the perse-



Lee Schulman

cution extends from the weak (the old women who were ordinarily the victims of village hatred) to the strong (the educated judges and clergy who resisted the craze). One indicia of "great fear" is when the elite of society are accused of being in league with the enemies.

Is it fair to compare the modern cases of "de-repressed memory" of child sexual trauma to the witch-crazes of several centuries ago? There are some parallels, but the differences are just as striking. In terms of similarities, some of the modern stories actually resemble the stories of earlier times (e.g., witches flying into bedrooms). Sometimes the stories encompass past-life memories (Stevenson 1994) or take on an even more bizarre, alien twist (Mack 1994).[1] In terms of differences, take a look at the accused and the accusers. In the most infamous witch hunt in North America, 300 years ago in Salem, Massachusetts, three-fourths of the accused were women (Watson 1992). Today, they are predominantly (but not all) men. Witches in New England were mostly poor women over 40 who were misfits, although later the set of witches included men (often the witches' husbands or sons), and still later the set expanded to include clergy, prominent merchants, or anyone who had dared to make an enemy. Today, the accused are often men of power and success. The witch accusations of past times were more often leveled by men, but today the accusations are predominantly leveled by women. Today's phenomenon is more than anything a movement of the weak against the strong. There is today a "great fear" that grips our society, and that is fear of child abuse. Rightfully we wish to ferret out these genuine "enemies" and point every finger of accusation at them. But this does not mean, of course, that every perceived enemy, every person with whom we may have feuded, should be labeled in this same way.

Trevor-Roper persuasively argued that the skeptics during the witch-craze did not make much of a dent in the frequency of bonfires and burnings until they challenged the core belief in Satan. What is the analogy to that core today? It may be some of the widely cherished beliefs of psychotherapists, such as the belief in the repressed-memory folklore. The repression theory is well articulated by Steele (1994: 41). It is the theory "that we forget events because they are too horrible to contemplate; that we cannot remember these forgotten events by any normal process of casting our minds back but can reliably retrieve them by special techniques; that these forgotten events, banished from consciousness, strive to enter it in disguised forms; that forgotten events have the power to cause apparently unrelated problems in our lives, which can be cured by excavating and reliving the forgotten event.

Is it time to admit that the repression folklore is simply a fairy tale? The tale may be appealing, but what of its relationship to science? Unfortunately, it is partly refuted, partly untested, and partly untestable. This is not to say that all recovered memories are thus false. Responsible skepticism is skepticism about some claims of recovered memory. It is not blanket rejection of all claims. People sometimes remember what was once forgotten; such forgetting and remembering does not mean repression and de-repression, but it does mean that some recently remembered events might reflect authentic memories. Each case must be examined on its merits to explore the credibility, the timing, the motives, the potential for suggestion, the corroboration, and other features to make an intelligent assessment of what any mental product means.

"Responsible skepticism is skepticism about some claims of recovered memory. It is not a blanket rejection of all claims."

The Case of Jennifer H.

Some writers have offered individual cases as proof that a stream of traumas can be massively repressed. Readers must beware that these case "proofs" may leave out critical information. Consider the supposedly ironclad case of Jennifer H. offered by Kandel and Kandel (1994) to readers of *Discover* magazine as an example of a corroborated de-repressed memory. According to the *Discover* account, Jennifer was a 23-year-old musician who recovered memories in therapy of her father raping her from the time she was 4 until she was 17. As her memories resurfaced, her panic attacks and other symptoms receded. Her father, a mechanical-engineering professor, denied any abuse. According to the *Discover* account, Jennifer sued her father, and at trial "corroboration" was produced: Jennifer's mother testified that she had seen the father lying on top of Jennifer's 14-year-old sister and that he had once fondled a baby-sitter in her early teens. The defendant's sister recalled his making passes at young girls. Before this case becomes urban legend and is used as proof of something that it might not be proof of, readers are entitled to know more.

Jennifer's case against her father went to trial in June 1993 in the U.S. District Court for the District of Massachusetts (*Hoult* v. *Hoult,* 1993). The case received considerable media attention (e.g., Kessler 1993). From the trial transcript, we learn that Jennifer, the oldest of four children, began therapy in the fall of 1984 with an unlicensed New York psychotherapist for problems with her boyfriend and divided loyalties surrounding her parents' divorce. Over the next year or so she experienced recurring nightmares with violent themes, and waking terrors. Her therapist practiced a "Gestalt" method of therapy; Jennifer describes one session: "I started the same thing of shutting my eyes and just trying to feel the feelings and not let them go away really fast. And [my therapist] just said 'Can you see anything?' . . . I couldn't see anything . . .

and then all of a sudden I saw this carved bedpost from my room when I was a child. . . . And then I saw my father, and I could feel him sitting on the bed next to me, and he was pushing me down, and I was saying, 'No.' And he started pushing up my nightgown and . . . was touching me with his hands on my breast, and then between my legs, and then he was touching me with his mouth . . . and then it just all like went away. It was like . . . on TV if there is all static. . . . It was, all of a sudden it was plusssssh, all stopped. And then I slowly opened my eyes in the session and I said, 'I never knew that happened to me'" (pp. 58-59).

Later Jennifer would have flashbacks that were so vivid that she could feel the lumpy blankets in her childhood bed. She remembered her father choking her and raping her in her parents' bedroom when she was about 12 or 13 (p. 91). She remembered her father threatening to rape her with a fishing pole in the den when she was about 6 or 7. She remembers her father raping her in the basement when she was in high school. The rape stopped just as her mother called down for them to come to dinner. She remembered her father raping her at her grandparents' home when she was in high school, while the large family were cooking and kids were playing. She remembered her father threatening to cut her with a letter opener, holding a kitchen knife to her throat (p. 113). She remembered him chasing her through the house with knives, trying to kill her, when she was about 13 years old (p. 283).

Jennifer also remembered a couple of incidents involving her mother. She remembered one time when she was raped in the bathroom and went to her mother wrapped in a towel with blood dripping. She remembered another incident, in which her father was raping her in her parents' bedroom and her mother came to the door and said, "David." The father then stopped raping her and went out to talk to the mother. Jennifer's mother said she had no recollection of these events, or of any sexual abuse. An expert witness testifying for Jennifer said it is common in cases of incest that mothers ignore the signs of abuse.

During the course of her memory development, Jennifer joined numerous sexual-abuse survivor groups. She read books about sexual abuse. She wrote columns. She contacted legislators. Jennifer was involved in years of therapy. She wrote letters about her abuse. In one letter, written to the President of Barnard College on February 7, 1987, she said "I am a victim of incestuous abuse by my father and physical abuse by my mother" (p. 175). In another letter to her friend Jane, written in January 1988, she talked about her therapy: "Well, my memories came out . . . when I would sit and focus on my feelings which I believe I call visualization exercises because I would try to visualize what I was feeling or be able to bring into my eyes what I could see" (pp. 247-248). She told Jane about her Gestalt therapy: "In Gestalt therapy, the sub-personalities are allowed to take over and converse with one another and hopefully resolve their conflicts. Each personality gets a different chair, and when one new one starts to speak, the individual changes into that personality's seat. It sounds weird, and it is. But is is also an amazing journey into one's self. I've come to recognize untold universes within myself. It feels often very much like a cosmic battle when they are all warring with one another" (pp. 287-288; see also page 249).

In one letter, written on January 11, 1989, to another rape survivor, she said that her father had raped her approximately 3,000 times. In another letter, dated January 30, 1989, she wrote: "Underneath all the tinsel and glitter was my father raping me every two days. My mother smiling and pretending not to know what the hell was going on, and probably Dad abusing my siblings as well" (pp. 244-245). In a letter written on April 24, 1989, to *Mother Jones* magazine she said that she had survived hundreds of rapes by her father (p. 231).

Before October 1985, Jennifer testified, she didn't "know" that her father had ever put his penis in her vagina, or that he had put his penis in her mouth, or that he put his mouth on her vagina (p. 290). She paid her therapist $19,329.59 (p. 155) to acquire that knowledge.

In sum, Jennifer reported that she had been molested by her father from the ages of 4 to 17 (p. 239); that she was molested hundreds if not thousands of times, even if she could not remember all of the incidents; that this sometimes happened with many family members nearby, and with her mother's "involvement" in some instances; and that she buried these memories until she was 24, at which time they purportedly began to return to her. No one saw.

These are a few of the facts that the Kandels left out of their article. Jennifer was on the stand for nearly three days. She had "experts" to say they believed her memories were real. These experts were apparently unaware of, or unwilling to heed, Yapko's (1994) warnings about the impossibility, without independent corroboration, of distinguishing reality from invention and his urgings that symptoms by themselves cannot establish the existence of past abuse. At trial, Jennifer's father testified for about a half-hour (Kessler 1993b). How long does it take to say, "I didn't do it"? Oddly, his attorneys put on no character witnesses or expert testimony of their own, apparently believing—wrongly—that the implausibility of the "memories" would be enough. A Massachusetts jury awarded Jennifer $500,000.

"Uncritical acceptance of every single claim of a recovered memory of sexual abuse . . . is not good for anyone."

Good and Bad Advice

Many of us would have serious reservations about the kinds of therapy activities engaged in by Jennifer H. and the kind of therapy practiced by the Southwestern therapist who treated pseudopatient Ruth. Even recovered-memory supporters like Briere (1992) might agree. He did, after all, say quite clearly: "Unfortunately, a number of clients and therapists appear driven to expose and confront every possible traumatic memory" (p. 136). Briere notes that extended and intense effort to make a client uncover all traumatic material is not a good idea since this is often to the detriment of other therapeutic tasks, such as support, consolidation, desensitization, and emotional insight.

Some will argue that the vigorous exploration of buried sex-abuse memories is acceptable because it has been going on for a long time. In fact, to think it is fine to do things the way they've always been done is to have a mind that is as closed and dangerous as a malfunctioning parachute. It is time to recognize that the dangers of false-memory creation are endemic to psychotherapy (Lynn and Nash 1994). Campbell (1994) makes reference to Thomas Kuhn as he argues that the existing paradigm (the theories, methods, procedures) of psychotherapy may no longer be viable. When this happens in other professions, a crisis prevails and the profession must undertake a paradigm shift.

It may be time for that paradigm shift and for an exploration of new techniques. At the very least, therapists should not let sexual trauma overshadow all other important events in a patient's life (Campbell 1994). Perhaps there are other explanations for the patient's current symptoms and problems. Good therapists remain open to alternative hypotheses. Andreasen (1988), for example, urges practitioners to be open to the hypothesis of metabolic or neurochemical abnormalities as cause of a wide range of mental disorders. Even pharmacologically sophisticated psychiatrists sometimes refer their patients to neurologists, endocrinologists, and urologists. For less serious mental problems we may find, as physicians did before the advent of powerful antibiotics, that they are like many infections—self-limiting, running their course and then ending on their own (Adler 1994).

When it comes to serious diseases, a question that many people ask of their physicians is "How long have I got?" As Buckman and Sabbagh (1993) have aptly pointed out, this is a difficult question to answer. Patients who get a "statistical" answer often feel angry and frustrated. Yet an uncertain answer is often the truthful answer. When a psychotherapy patient asks, "Why am I depressed?" the therapist who refrains from giving an erroneous answer, however frustrating silence might be, is probably operating closer to the patient's best interests. Likewise, nonconventional "healers" who, relative to conventional physicians, give their patients unwarranted certainty and excess attention, may make the patients temporarily feel better, but in the end may not be helping them at all.

"Bad therapy based on bad theory is like a too-heavy oil that, instead of lubricating, can gum up the works—slowing everything down and heating everything up."

Bad therapy based on bad theory is like a too-heavy oil that, instead of lubricating, can gum up the works—slowing everything down and heating everything up. When the mental works are slowed down and heated up, stray particles of false memory can, unfortunately, get stuck in it.

To avoid mucking up the works, constructive advice has been offered by Byrd (1994) and by Gold, Hughes, and Hohnecker (1994): Focus on enhancement of functioning rather than uncovering buried memories. If it is necessary to recover memories, do not contaminate the process with suggestions. Guard against personal biases. Be cautious about the use of hypnosis in the recovery of memories. Bibliotherapeutic and group therapy should not be encouraged until the patient has reasonable certainty that the sex abuse really happened. Development and evaluation of other behavioral and pharmacological therapies that minimize the possibility of false memories and false diagnoses should be encouraged.

Instead of dwelling on the misery of childhood and digging for childhood sexual trauma as its cause, why not spend some time doing something completely different. Borrowing from John Gottman's (1994) excellent advice on how to make your marriage succeed, patients might be reminded that negative events in their lives do not completely cancel out all the positives (p. 182). Encourage the patient to think about the positive aspects of life—even to look through picture albums from vacations and birthdays. Think of patients as the architects of their thoughts, and guide them to build a few happy rooms. The glass that's half empty is also half full. Gottman recognized the need for some real basis for positive thoughts, but in many families, as in many marriages, the basis does exist. Campbell (1994) offers similar advice. Therapists, he believes, should encourage their clients to recall some positive things about their families. A competent therapist will help others support and assist the client, and help the client direct feelings of gratitude toward those significant others.

Final Remarks

We live in a culture of accusation. When it comes to molestation, the accused is almost always considered guilty as charged. Some claims of sexual abuse are as believable as any other reports based on memory, but others may not be. However, not all claims are true. As Reich (1994) has argued:

"When we uncritically embrace reports of recovered memories of sexual abuse, and when we nonchalantly assume that they must be as good as our ordinary memories, we debase the coinage of memory altogether" (p. 38). Uncritical acceptance of every single claim of a recovered memory of sexual abuse, no matter how bizarre, is not good for anyone—not the client, not the family, not the mental-health profession, not the precious human faculty of memory. And let us not forget one final tragic consequence of overenthusiastic embracing of every supposedly de-repressed memory; these activities are sure to trivialize the genuine memories of abuse and increase the suffering of real victims who wish and deserve, more than anything else, just to be believed.

We need to find ways of educating people who presume to know the truth. We particularly need to reach those individuals who, for some reason, feel better after they have led their clients—probably unwittingly—to falsely believe that family members have committed some terrible evil. If "truth" is our goal, then the search for evil must go beyond "feeling good" to include standards of fairness, burdens of proof, and presumptions of innocence. When we loosen our hold on these ideals, we risk a return to those times when good and moral human beings convinced themselves that a belief in the Devil meant proof of his existence. Instead, we should be marshaling all the science we can find to stop the modern-day Reverend Hale (from *The Crucible*), who, if he lived today would still be telling anyone who would listen that he had seen "frightful proofs" that the Devil was alive. He would still be urging that we follow wherever "the accusing finger points"!

Note

1. John Mack details the kidnappings of 13 individuals by aliens, some of whom were experimented upon sexually. Mack believes their stories, and has impressed some journalists with his sincerity and depth of concern for the abductors (Neimark 1994). Carl Sagan's (1993:7) comment on UFO memories: "There is genuine scientific paydirt in UFO's and alien abductions—but it is, I think, of distinctly terrestrial origin."

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Severe Flaws in Scientific Study Criticizing Evolution

DAN LARHAMMAR

Undocumented experiments, unreasonable precisions, and nonexistent references indicate the Kuznetsov critique has no scientific basis.

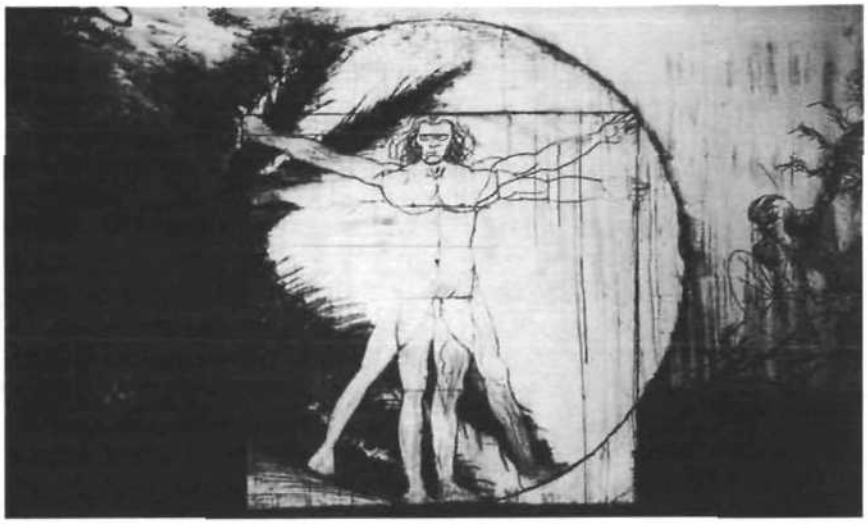
Evolution is the process that has led to the life forms that inhabit Earth today and provides the fundamental basis for our understanding of all biology. The progress in molecular genetics over the past several years has provided overwhelming independent support for evolution and has helped clarify evolutionary processes. No genetic evidence has been found that argues against evolution as a phenomenon. A few creationist books have tried to interpret molecular data differently, but have only revealed their own fundamental misunderstandings, for instance Michael Denton's *Evolution: A Theory in Crisis.*

I am aware of only a single report in an established scientific journal that has claimed molecular data against evolution in modern times. The article was published in the *International Journal of Neuroscience* in 1989 (49: 43-59) by Dmitrii A. Kuznetsov (Moscow, Russia) and

apparently went unnoticed for a long time since this type of work is not within the regular scope of that journal. I was recently made aware of Kuznetsov's article by a Swedish creationist. Because I found severe flaws in Kuznetsov's methodology and discovered that many of the references cited in his article appear to be nonexistent, I contacted the editor of the journal, who offered to publish my critique (*International Journal of Neuroscience,* 77: 199-201, 1994). I summarize here Kuznetsov's study and describe the main flaws in his work.

Kuznetsov's article was published under the complex title *"In vitro* studies of interactions between frequent and unique mRNAs and cytoplasmic factors from brain tissue of several species of wild timber voles of Northern Eurasia, *Clethrionomys glareolus, Clethrionomys frater* and *Clethrionomys gapperi:* A new criticism to a modern molecular-genetic concept of biological evolution." Briefly, Kuznetsov studied the go-between that converts the information of the genes into functional proteins, the so-called messenger RNA (mRNA) molecules. He isolated such mRNA from three species of voles and used this to produce protein in test tubes. Surprisingly, each vole species was found to have a substance that blocked the production of protein from the other two species' mRNA (but it did not block its own mRNA). Remarkably, this inhibiting substance did not prevent protein synthesis from mRNAs of two distantly related species, namely, rabbit and human. Kuznetsov called his substance an "antievolutionary factor" that would serve to maintain constancy of species. He interpreted his results as "a new criticism to a modern molecular-genetic concept of biological evolution" that could be used to support "the general creationist concept on the problems of the origin of boundless multitudes of different and harmonically functioning forms of life."

Dan Larhammar is a professor of Medical Genetics at Uppsala University, Box 589, S-751 23 Uppsala, Sweden.



Scorpio, Patrick Hubenthal

The experimental approach used by Kuznetsov is extraordinary and obscure (for technical details, see my critique published in the *International Journal of Neuroscience*). None of his experiments were documented qualitatively; the report contains only tables and numbers, and the numerical results indicate experimental precision that is beyond normal accuracy for such assays. This could indicate that some of the results were fabricated. Kuznetsov disregarded that mRNA sequence variability between species displays a continuous spectrum from some highly similar molecules to some widely divergent molecules. In fact, a single mRNA molecule may be highly conserved in one part but dramatically divergent in other parts. Furthermore, Kuznetsov ignored the fact that one feature is shared by almost all mRNA molecules, the so-called poly(A) tail. Finally, the complex vole mRNA samples (many different molecules) were compared with individual mRNA molecules from the distantly related species rabbit and human. Thus, it is exceedingly unlikely that an "antievolutionary factor" would be able to recognize and block mRNA molecules from a closely related species (but not from distantly related species).

One of the procedures that Kuznetsov used was cited to be published by other researchers in "Uppsala University Research Reports" in 1974 (this is the university where I work), but no such journal has been heard of at this university and no persons with the names cited could be traced. Other important aspects of Kuznetsov's methodology were referenced to articles in four other scientific journals. None of these journals could be found, not even in the internationally used library indexes called Medline and CASSI (Chemical Abstracts Service Source Index). Two of the methodological references were purportedly published by Kuznetsov himself, but these journals were also impossible to find. Remarkably, these two references were absent from Kuznetsov's own list of publications distributed by a Swedish creationist before his recent visit to Sweden. Finally, an article ascribed to Holger Hydén (a member of the editorial board of the *International Journal of Neuroscience*) is unknown to Hydén himself. The Scandinavian journal where the article was said by Kuznetsov to be published does not exist. This purported article as well as several others in the list of references had illogical titles with grammatical errors. Taken together this strongly suggests that many of the references could have been fabricated by Kuznetsov.

In conclusion, Kuznetsov's obscure experimental approach, qualitatively undocumented results, and incomplete evaluation undermine all his conclusions. All key methodological references seem to be nonexistent. Thus, Kuznetsov's critique of evolution has no scientific basis. That his anti-evolutionary article was simply a bad joke is unlikely since it is indeed included in his list of scientific publications. □

"Lights Out!" A Faxlore Phenomenon

JAN HAROLD BRUNVAND

In late summer 1993, a warning about murderous gang initiations caused national concern.

On Saturday August 14, 1993, a small news item—about six column inches—debunking a "faxed warning about gang initiation," appeared in the *Memphis Commercial Appeal.* The headline was "Officials Deny Faxing Gang Warnings," and the subhead read, "Untrue documents promote hysteria." The documents were described as "heavily faxed" and claimed to be official police bulletins. They stated, "This is the time of year for gang initiation," and described the specific threat as follows:

> One of the methods used this year will be for gang members to drive with their lights off at night. When you blink your lights or flash your high beams, they will follow you home and attempt to murder you.

At a press conference, officials of Memphis and of Shelby County, Tennessee, said that these "fax driven rumors criss-crossed the county this week," that police

were inundated with calls about them, but that no local law-enforcement office had sent out the faxes, nor was there any evidence for such gang initiation practices.

Although it is clear in this news item that the "Lights Out!" rumor was *already in active circulation, this is the* earliest example I have located. The next time I encountered the rumor was in an E-mail message from Chicago sent on September 9, and the next *published* report I found was in a suburban Chicago newspaper on September 11, four weeks after the Memphis report. But soon the "Lights Out!" rumor emerged in many cities and became a matter of national concern. The flap continued through autumn 1993 and even into the new year in some places. The rumor was driven nationwide largely by facsimile transmissions and thus provides a unique example of a faxlore phenomenon, likely the trend of the future in the circulation of urban rumors and legends.

I collected three kinds of information about "Lights Out!": (1) copies of the warnings themselves, (2) letters from people reporting on the warnings, and (3) further news stories.

My September 9 E-mail report came from someone at the University of Chicago who forwarded a memo credited to the Security Division of the First National Bank of Chicago. The first line, "Beware," was followed by two exclamation points; the capsule description of the initiation ritual, said to be planned for "the Chicagoland area," was followed by the bare elements of an illustrative story: "To date, two families have already fallen victim to this senseless crime." The memo concluded with an appeal for readers to "inform your friends and family not to flash their car lights at anyone!" This early example of the "Lights Out!" warning displays typical features of all subsequent versions: it uses somewhat sensational language, repeats the basic rumor (naming it as "Lights Out!"), and provides a validating reference (i.e., the bank's memo format); it also localizes the supposed criminal plans, alludes in a vague way to specific cases, and recommends a course of action.

Later versions of the warning—usually computer-written and often laser-printed—tend to have more exclamation points (sometimes coming before as well as after sentences), to have more words or whole lines printed in all caps or underlined (sometimes double-underlined, and sometimes both all caps and underlined), and often to have handwritten additions like *"This is not a joke,"* or *"Be careful out there,"* or *"Urgent!"* A few examples were hand-lettered and photocopied or were retyped on a company's letterhead (including the City of Detroit Water and Sewerage Department). Most examples that I collected had been faxed; others were E-mailed, sent by post-office mail, or posted as hard-copy memos on bulletin boards.

Dates on these warnings range from early September to early December *1993, most coming in mid-September.* Other cities mentioned in them are St. Louis, Detroit, Dallas, Atlanta, Norfolk (Virginia), New York, Baltimore, Los Angeles, Sacramento, and Honolulu. (Articles in the press added Memphis, Toledo, Columbus, Pittsburgh, Philadelphia, Washington, D.C., Minneapolis, Little Rock, Tulsa, Houston, San Antonio, Lubbock, Denver, Salt Lake City, San Jose, and San Francisco, Letters from readers added cities in New Jersey, Florida, Missouri, and the Northwest. Clearly, the "Lights Out!" rumor was flying coast to coast.) The institutions circulating the fliers were banks, businesses, law firms, universities, military posts, hospitals, and day-care centers. Several of the warning notices contain routing stamps or slips indicating that they were circulated throughout a whole office or company.

About mid-September the warnings began to name "Grady Harn of the Sacramento Police Department" as the source of the information. Also, the

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This article began as a paper given at the annual meeting of the California Folklore Society at U.C. Davis in April 1994. Jan Harold Brunvand is professor of English at the University of Utah, Salt Lake City, UT 84112, and the author of many books on urban legends.

weekend of September 25 and 26 was pinpointed as "Blood [or Bloods'] Initiation Weekend," when, supposedly, gangs, including the notorious Bloods' Gang, would hold their murderous initiation.[1] A few of the fliers, although unsigned, made first-person reference to "my stepfather" or to another relative who had "called me" with this important information. Some fliers admitted that "this information has not been confirmed," but most fliers still advised readers not to flash their lights at anyone, just in case. One person sending me a printed flier added in a note: "One of our stupidvisers [at work] stood up and read this to us." After the supposed "Bloods' Weekend" came and went without incident, the fliers—now minus the dates—continued to appear, mostly in fax machines.

During the 1993 autumn semester at Indiana University at Kokomo a Folklore class studied the "Lights Out!" rumor. The instructor, Susanne Ridlen, forwarded a packet of the 20 items resulting from the project, and these display the variations of the story in one community and of the means by which it was transmitted.

The Kokomo students documented transmission of "Lights Out!" via word of mouth, telephone (including long-distance calls), on both commercial and CB radio, via E-mail, fax, printed memos (distributed in schools and workplaces), and in publications. Several Kokomo versions combined "Lights Out!" with other car-related legends (Brunvand 1981: 19-46; 1984: 50-68; 1986: 49-67; 1989: 89-128), and some people claimed that the gang initiations included the cutting off of feet or ears. The specific gangs involved were said to be the Crypts [*sic*] and the Bloods, groups said to be moving to Kokomo either south from Chicago or north from Indianapolis. Other versions claimed an origin of the information from Mississippi, where such initiations supposedly had occurred. Motorists would be targeted either if they blinked (or "flickered") their lights *or* if they honked at a gang car driving without lights. Police were said to be warning motorists—via gas-station attendants—not to flash their lights. Despite this, two (or three) people, according to the Kokomo rumors, had already died.

A story in the *Kokomo Tribune* on October 14, ("Police Shoot Hole in Gang Initiation Rumor") described "Lights Out!" as a baseless rumor that was thought to have reached Kokomo from Jackson, Mississippi, on September 19 in a message broadcast on CB radio. Both Indiana and Illinois state police gang-crimes units were quoted in the news story as denying the rumor.

(Similarly, the Salt Lake City Police Department on September 24 issued a news release calling the "Lights Out!" story "unfounded . . . unsubstantiated and without merit." Many police departments across the nation issued similar denials.)

The letters (including E-mail, snail-mail, and faxed correspondence) that I received from readers of my books commenting on the "Lights Out!" rumor add to the sketchy story a few more details that must have circulated orally, since they do not appear in the printed fliers. These letters were dated from mid-September 1993 to April 11, 1994, and came from people who knew or suspected that the story was false. Most letters reported a chain of informal communication of the story—i.e., a co-worker whose girlfriend, a nurse, had heard about someone working on the other shift at the hospital or at a different hospital who had treated victims of the ritual. The initiations, according to some writers, "were supposed to test the mental toughness" of gang recruits. Sometimes the gang recruits would trace the offending cars via their license plates. The police were not publicizing the crimes, according to rumors, in order to lull gangs into a false sense of security in hopes that they could be caught in the act. A letter dated March 29, 1994, from New Cumberland, Pennsylvania, reported a variation in the story: "Cars Full of Satan Worshippers Driving Around Without Their Headlights." The writer had overheard his secretary warning her sister about the threat, and she had heard it from the driver of her van pool, who had heard it from a friend who saw a sign warning people about it in a store window.

A Seattle reader in a letter dated September 24 (the Friday before "Bloods' Weekend") mentioned that on Thursday the 23rd the flier appeared at her workplace and "to my distress, every one of my twelve co-workers fell for it . . . despite my insistence that it couldn't possibly be true." Meanwhile, in Salt Lake City in my own department at the university, here's what happened—or *nearly* happened—on the same days. On the 23rd, a reader from Fort Lauderdale, Florida, faxed me a letter saying he was also faxing a copy of a memo that he suspected was based on a rumor; page 2 of the fax transmission was the "Lights Out!" warning itself, typed on the letterhead of a Florida Jewish community center. The secretary of my department pulled page 1 of the message and put it into my mailbox without reading it beyond the address. Page 2—the warning memo—however, she read with alarm and then took it with her on Friday to a full departmental meeting; or, not *quite* a full meeting, since I myself, as a partial retiree, had decided to skip town that afternoon. The secretary intended to read the notice to the assembled faculty in order to alert them not to flash their lights when driving home, but she was dissuaded from doing so by my colleague, folklorist Margaret Brady. Brady convinced her that the warning was just "one of those legends that people are always sending Jan." Our secretary still felt the story might be true, since her own daughter had also heard about it in Salt Lake City a few days earlier.

The news stories about "Lights Out!" may be taken in chronological order, insofar as dates can be determined from the clippings.

As mentioned earlier, the first clipping I have is from the *Memphis Commercial Appeal* of August 14. The second is from the *Daily Southtown*, a suburban Chicago paper, on September 11 ("Police Say Area Story of Gang Rite Is Hoax"). The lead reads: "It's a great story—just like most so-called 'urban legends.'" Besides describing the same "anonymous hand-

bills," this news story quotes police officials who deny it and adds that it sounds like something that might happen "in the frozen wastelands of Russia." The news story also suggests the possibility of copycat crimes, and it concludes with the threat of prosecution against spreaders of the tale. Every facet of this fairly obscure little news item turns out to be typical of what most papers wrote.

Four days later, on September 15, Mary Schmich, a *Chicago Tribune* columnist, wrote about the rumor, calling it "urban faxlore." Schmich identified the Black Gangster Disciple Nation as the Chicago street gang blamed for the outrage, but she emphasized that the rumor was unsubstantiated and strongly denied by Chicago police. Schmich listed radio stations, colleges, hospitals, churches, and video stores as places where the warning had appeared. Because she had phoned me to discuss the rumor, Schmich was able to cite the earlier Memphis example of the story and also to compare "Lights Out!" to other urban lore about crime and violence. (Mary Schmich said that she was calling me at the suggestion of folklorist Alan Dundes of U.C. Berkeley, whom she had called earlier. He had not yet heard about the warnings but thought that I might have.)

At this point my phone began ringing off the hook, and I was preparing to leave on an extended trip; so I put a message on my answering machine saying, in effect, "No interviews, please." I decided to stay out of the spotlight and see what reporters might make of the rumor on their own, or with the help of other folklorists whom they might contact.

Shortly after taking this vow of [illegible] I started to see results: on September 18 two papers ran stories—the Little Rock *Arkansas Democrat-Gazette* ("Gang Initiation Rumor Baseless, LR Police Say") and the *San Jose Mercury News* ("Cops Try to Arrest Rumor of Gang Rite"). The enterprising Arkansas reporter located three of the Brunvand books and compared "Lights Out!" to other urban lore, including an earlier local outbreak of "The Mutilated Boy" legend (Brunvand 1984: 78-92; 1986: 148-156). The even more enterprising San Jose reporter managed to get a Memphis Police spokesman and Alan Dundes on the phone. From Tennessee she learned that the story was known in Knoxville and Chattanooga as well; from Dundes (who now had heard the story and had a comment ready for it) she picked up the term *faxlore* and also the ideas that a fear of teenagers—especially gang members—was reflected in the story and that it might be inspired by acts of violence against tourists in Florida. In an unusual twist, the *Mercury News* withheld details of the warnings, fearing, they said, to suggest copycat crimes. This article also referred to the speed with which the rumor had blanketed Silicon Valley, where thousands of people are linked to E-mail and to computer bulletin boards.

In Salt Lake City (where I also dodged the press) another gang rumor was flying—that gangs were planning to rape a cheerleader as part of an initiation. Although police and school authorities denied the rumor, a September 18 article in the *Deseret News* reported widespread concern among students and parents, especially on the more affluent east side of the Salt Lake Valley. One television station was criticized for publicizing the story, even though the broadcast had made it clear that the rumors were unconfirmed.

Meanwhile, back in Chicago, on September 21, the student newspaper of the University of Illinois branch there was debunking the story again. One version of the warning photocopied on a state police letterhead was described as having a typeface that did not match the rest of the letterhead, a clue to its unreliability.

On September 22, the *Houston Post*, the *Houston Chronicle*, and the *Toledo Blade* ran articles on the rumor. The *Post* article ("Scary Gang Rumor Has Its Fax All Wrong") was pretty standard, except for calling the warning "an electronic chain letter" and "an urban myth[!]" (Maybe I should have answered the phone after all.) The *Chronicle* article ("HPD Tries to Stop Rumor About Gang Rites") had a novel touch—a color photograph of a grinning police chief holding up one of the fliers; the "Dragnet"-inspired caption read, "Just a phony fax, ma'am." The chief was quoted as saying, "I'd rather deal with the gangs than talk to any more hysterical people on the phone."

A sidelight of the Texas circulation of the rumor was revealed September 23 in a column in the *San Antonio Express-News*. Columnist Roddy Stinson, who a week earlier had dubbed his own city "the wide-eyed booby capital of the nation" for panicking over the "Lights Out!" urban legend (Stinson's term), now gave the booby prize to Houston, where the story had circulated earlier.

During "Bloods' Weekend" itself—September 25 and 26—the newspaper stories increased: I have clippings from papers in central New Jersey, San Francisco, Los Angeles, Salt Lake City, Minneapolis, and Pittsburgh. The New Jersey story mentions dozens of calls to police from fearful people, spurred by warnings traced to the Johnson & Johnson headquarters in New Brunswick and also circulated in area colleges and high schools and in a large insurance company. The San Francisco article ("Rumors Fly on Computer Networks") also names hospitals as hotbeds of the story, but emphasizes computer rather than faxed transmission. Alan Dundes is quoted anew, this time with a different slant on the story. "There is an element of the car, which represents power, mobility, and sex," the Berkeley professor comments,

"The rumor was driven nationwide largely by facsimile transmissions . . . likely the trend of the future in the circulation of urban rumors and legends."

adding that the rumor was probably fueled by recent shootings of foreign tourists in Florida.

The *L.A. Times* article of September 24 is the first publication to mention the mysterious Grady Harn of the Sacramento Police Department, who is named on many fliers; the *Times* checked with Sacramento and found that no one of that name serves on the police force there. Another innovation in the *Times* story is an unattributed claim that "the warnings are the work of a computer hacker who used facsimile telephone numbers to disseminate the messages." The fliers are described as "clumsily worded," which suggests, perhaps, poor social or communicative skills of the assumed hacker. Finally, the *L.A. Times* mentions that these phony warnings are "the latest examples of what sociologists call an urban myth." Although Los Angeles gang investigators are quoted in the story, the reporters who wrote the piece did not attempt to interview any gang members themselves.

Both Salt Lake City newspapers now covered the story, each relating it to the earlier rumors about gang intentions to rape cheerleaders. One county sheriff in Utah said he had not been able to get off the phone for more than 30 seconds at a time while fielding calls about "Lights Out!" from citizens and from the press. In a technically garbled explanation of how the story may have started, a police official suggested that "the hoax note was faxed into a billboard computer system."

Probably "Bloods' Weekend" was when the Associated Press circulated an article debunking "Lights Out!" that was widely reprinted and quoted. (I do not have a dated copy of the AP release.) The AP story quoted Ralph Rosnow and Gary Fine, coauthors of a book on rumor and gossip. Fine voiced the opinion that "*gang* in this particular rumor is a code word for poor, young black men."

The Minneapolis news article of September 25 again described the suspected villain in the case as a "hacker," but the paper associated "hacking" with *faxing* messages rather than with using computerized E-mail or a computer bulletin board. Articles published in Pittsburgh on September 25 and 27 added little to the picture except for speculating that the rumor came from "an unidentified originator in California."

In an interesting juxtaposition, the *Baltimore Sun* on September 27 ran a long story debunking the "Blue Star Acid" rumor (Brunvand 1984:162-169; 1989: 55-64), which had cropped up there again recently with a sidebar story on "Lights Out!" The Baltimore version was that members of "the Los Angeles-based gang the Bloods were randomly shooting motorists as part of a nationwide initiation campaign."

At last the rumor was mentioned in the national press. In the September 27 issue of *U.S. News & World Report,* a column by John Leo mentioned "Lights Out!" in passing as "a new bit of urban folklore." The column was mostly devoted to comments on the shootings of foreign tourists in Florida. *Newsweek,* in a brief notice headlined "Big Fax Attack," mentioned Houston, Los Angeles, and Atlanta as sites of the rumor. In a syndicated column of September 29, William Raspberry of the *Washington Post* mentioned the rumor, although he indicated that just "people" (gangs were not mentioned) were driving with their lights off, hoping to entice victims to flash their headlights at them and thus become targets for violence.

The last weekend of September the magazine section of the *Dallas Observer* ran a detailed account titled "Anatomy of a Rumor: How the Gang-Initiation Story Terrified Dallas." The author called it "something of a minor urban myth in several cities," and he did a creditable job of tracking local versions back to individuals who had picked it up while traveling, on the phone, via fax, and so on. According to the *Observer,* one Dallas businessman said he was handed the warning "when he boarded an American Airlines return flight from Tampa."

From October to mid-December only a few further news stories appeared; the cities that were late to catch the rumor were Denver; Philadelphia and Allentown, Pennsylvania; Columbus, Ohio; and Lubbock, Texas. With Lubbock, on December 14, my clipping file bottoms out. The Denver story was mainly about rumors of gang rapes at a mall, with "Lights Out!" mentioned only in passing. The *Philadelphia Inquirer* story was unrestrained in calling the rumor "a big, fat, stinking, Pinocchio-nose kind of lie," but added, "and everybody believes it." Ralph Rosnow, who teaches at Temple University, was again quoted. The *Allentown Morning Call* story mentioned that the rumor had been retyped on Thomas Jefferson University security letterhead; both Patricia Turner, a professor at U.C. Davis, and Alan Dundes were quoted in this story, evidently from original interviews by the Allentown writer. Turner made some interesting observations about the theme of the "demonized outsider" threatening a Good Samaritan on the road. Dundes repeated some of his earlier remarks, and he too touched on the "Good Samaritan" theme.

In Columbus, "Lights Out!" got only a short paragraph in a story that was primarily about another rumor—that groups are trying to raise funds to buy firearms for the homeless. Similarly, in Lubbock, Texas, "Lights Out!" rated only a short mention in a full-page feature story about "Those pesky rumors." The only unusual touch here was the remark of a local police sergeant about how he deals with the panicky public in such cases; he said, "I just try to sound authoritative and reassuring." By mid-December, then, the story was effectively dead in the nation's media, although a few individuals continued to write me letters about it.

Unexpectedly, "Lights Out!" emerged one more time in the national media in "Traps," a new CBS-TV police drama, in which George C. Scott plays Joe Trapcheck, a former homicide investigator who comes out of retirement to serve as a consultant in his old department. In the premiere episode, aired on Thursday, March 31, 1994, he has joined the "Headlight

Killer Taskforce," which is working to solve a series of shootings that occurred after people gave a "courtesy blink" to a car driving with its headlights out. Curiously, the episode also included another piece of urban folklore, where a photocopy machine is used to fool a suspect into revealing needed information; he is told that he's actually hooked up to a new type of polygraph (Brunvand 1993:139-145).

Reviewing the "Lights Out!" phenomenon, briefly, as *folklore,* it seems evident that although modern technology and communications facilitated the rapid dissemination of the rumor over an extremely broad area, the variations that developed were similar to those typically caused by oral transmission alone. Details were added and altered; the story was localized; authorities were invoked to support the story; supposed actual cases were cited, and so on. "Lights Out!" was similar to other recent rumors and legends, including "Blue Star Acid" (also fax- and photocopy-delivered), "The Assailant in the Backseat" and other car horror stories, "The Attempted Abduction" and other mall-crime stories, and the like. *Faxlore* is a catchy term, but it is not clear that it should imply any essentially different kind of modern tradition.

Despite the sensational tone of the warnings, their informal channels of distribution, their poor English usage, and their lack of any specific verification, their message was taken to heart by many Americans. Thousands of people must have duplicated and distributed the fliers for them to have penetrated so widely. I believe the folklorists and sociologists who commented on "Lights Out!" were right in identifying themes like teenage and gang crimes, racism, urban problems, and attacks on foreign motorists as topics underlying the "Lights Out!" hysteria. (I'm not sure, however, where the sex, mentioned by Alan Dundes, comes in.) A well-known gang name, the Bloods, lent itself perfectly to intensifying the hysteria, as did another name, the Cryps (when misunderstood as "Crypts"). In Chicago, a gang with the very word "Black" in its name—the Black Gangster Disciple Nation—fed into this same racial fear, and, in Kokomo the idea that the warning had come from Mississippi implies the same stereotype.

Press reports reveal other views of the rumor flap. Journalists tended to confuse terms like *myth, rumor, legend, chain letter,* and *hoax,* as well as to ignore the technical differences between fax, E-mail, and computer bulletin boards or computer newsgroups. Several newspapers mentioned copycat crimes, although none of the papers ever reported any actual "Lights Out!" crimes *or* copycats. In hope of determining the precise origin of the rumor—something folklorists seldom seek or find—journalists focused upon (indeed, may have *invented*) the *hoaxing hacker* character, presumably someone from California. No evidence for the existence of such a hoaxer was ever presented. An idea proposed by both law-enforcement and newspaper sources is that the originator of the story should be found and prosecuted. Despite having this serious plan in mind, newspapers felt free to pun shamelessly in the wording of their stories and headlines: "just the fax," "a fax attack," "has its fax all wrong," "guns down the rumor," and others.

One persistent fear that both the general public and newspapers responded to was the idea of dangerous gang activity entering one's own community from some outside source, usually a nearby larger city that is thought to be awash with gang crimes. It still amazes me (as mentioned above) that no investigative reporter seems to have bothered to have contacted any local gang members to ask about initiation rituals in general and about "Lights Out!" or other car-related customs in particular.

Finally, I reemphasize one theme of the warnings pointed out in only a single news article among the reports I collected. This is the "Good Samaritan" theme mentioned by Turner and Dundes. Flashing one's headlights at a car driving toward you at night without its lights on is a simple, common act of courtesy and safety. It's something most drivers have been taught to do, either by a driver's education teacher or simply by customary example from other drivers. (I'll be so bold as to call this a folk custom.) Some of the warning fliers allude to this custom by referring to it as a "courtesy flash." (I'll concede, however, that light flashing may also imply negative criticism in the minds of some drivers who flash or are flashed at.) Another strong message of "Lights Out!" then, is that something you, as a driver, have learned to do as a good and socially useful thing may, in this crime-ridden modern world, have become an act of aggression toward another driver who represents an outsider to your standards of behavior—perhaps a younger person of a different race who belongs to a street gang—and this outsider will go so far as to murder you for daring to be courteous. In other words, the "Lights Out!" rumor says, "Forget about being a courteous driver, because *it might kill you!*"

Note

1. Folklorist Ed Kahn of Berkeley, California, pointed out to me the similarity to the much-feared "Michelangelo" computer virus, supposedly set to strike DOS-based machines worldwide on March 6 (the Renaissance master's birthdate), 1992. Like the "DataCrime" (or "Friday the 13th") virus of 1989, this threat proved to be much less destructive than predicted.

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A year ago in these pages Paul Kurtz and Gerald Holton addressed the growing antiscience movement in America—a frontal attack, often by intellectuals, on science and reason as a way of thought. We now return to this crucial issue, with incisive new explorations of antiscience in academia. First is the article "Knocking Science for Fun and Profit," by biologist Paul R. Gross and mathematician Norman Levitt, authors of the provocative new book Higher Superstition. *They discuss disturbing trends to substitute ideology for objective science. Next Noretta Koertge, a philosopher of science and coauthor of* Professing Feminism, *writes briefly on a specific aspect of the problem in "How Feminism Is Now Alienating Women from Science." In the Book Reviews section we then offer two contrasting reviews of* Higher Superstition, *one by Keith M. Parsons, the other by Taner Edis and Amy Sue Bix, followed by George Fish's review of two works highly critical of science, Aronowitz's* Science As Power *and Carnes's* Questioning Technology. *Together these thoughtful articles, essays, and reviews explore from several perspectives a serious issue of concern well beyond the boundaries of university life.*

Knocking Science for Fun and Profit

PAUL R. GROSS AND NORMAN LEVITT

"A new, ideologically based criticism of science as a way of thought has become fashionable in academic circles and is debasing public discourse about important issues of science and technology."

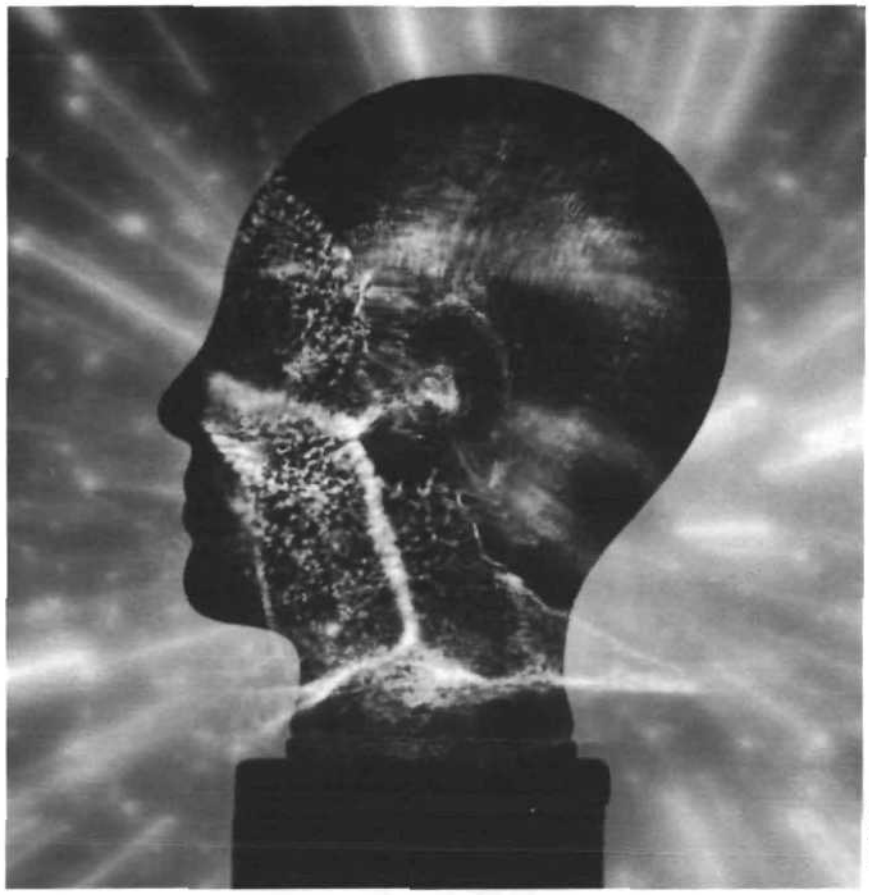
A new and fashionable cottage industry has appeared among the intelligentsia, especially among academics. Its principal activity is to issue quantities of arrogant and hostile criticism of science. Science, that is to say, as an institution and a way of thought, as an attitude toward knowledge. The specific content of the examined science rarely comes into it, for the simple reason that the trendier critics don't bother to study the science seriously. In our recently published book, *Higher Superstition: The Academic Left and Its Quarrels with Science,* we have examined this disturbing trend in some detail.

This style of criticism must be distinguished from the informed judgments that have by tradition been a part, explicitly or otherwise, of serious philosophy and history of science, and that have, at their best, encompassed the logic, the evidence, and the methodological constraints of the science under study. At the same time, the new fashion in science studies goes beyond the Romantic discontent and the edenic nostalgia that have for three hundred years (if not for more than two thousand) been antagonistic to science and to rationality in general.

Science criticism based solidly on knowledge of science is valuable. It has had positive effects on scientific progress and has influenced the way good scientists think about their work. Romantic antagonism has had little or no effect, despite great swings from approval to disapproval, and back again, in the general culture of the Western world. What concerns us, however, is the new brand of criticism, a hybrid discipline ("discipline" may be too generous a term) whose external semblances are variously sociological, historical, even philosophical, but whose underlying motive is none of these. Rather, it is ideology that is in the driver's seat—specifically, the ideology of what has been called the "academic" or "cultural" left.

This "academic left," we are careful to note, is by no means the same

thing as the set of all academics with left-wing political views. It is one particular faction of that larger set, and, indeed, has come in for almost as much criticism from liberals as from conservatives. Nevertheless, it has been remarkably successful in winning recruits among partisans of various political causes. Its view of science is today highly influential within the academy (except among working scientists) and increasingly so outside the campus gates. In part, this is due to a tactical exploit of the new science-critics: they have avoided the professional scrutiny of scientists and others devoted to reason as a means of understanding the world. We believe this phenomenon to be dangerous, and not only to the vanity of scientists! In what follows—material taken with very slight modification from the closing chapter of our book—we discuss some of the reasons for our concern. Most important is the debasement of the public discourse of science and technology, a discourse already inadequate to the complexity of the global issues at whose heart lie scientific questions.



Lee Schulman

If, as seems obvious, scientific and technical issues will become increasingly and urgently relevant to public policy in the decades ahead, how well will such matters be debated in this country? Obviously, we cannot hold high hopes. The historical record of American education in making the general public conversant with basic science has always been poor, except for a brief flurry of serious effort in the post-Sputnik era. Superstition, whether about astrology, ancient astronauts, or alien abductions, has always had easy and profitable going. Fringe medicine and outright quackery, long endemic in American culture, have taken on new and ominous vigor, thanks in part to the rising costs and increasing impersonality of ordinary health care. The contrast between the incomparable virtuosity of professional American science and the general disregard of scientific substance, whether from complacency or hostility, on the part of the larger public grows ever more pronounced. It is one of the great social paradoxes of history.

Those on the left of the political spectrum are concerned, and rightly so, about the abridgment of democratic procedure and debate inherent in a system that delegates all responsibility for important policy matters to a technocratic elite. These misgivings are manifestations of a significant dilemma. How are such decisions to be made in a manner that takes serious and accurate account of technical and scientific matters without abrogating popular rule or reducing it to a mere symbol? Dozens of pressing issues, from AIDS to alternative energy sources, are complicated by this question. How do we permit a wide public to have a serious voice in such deliberations without inviting in gullibility, ignorance, and mere faddishness? The easy answer, of course, is to educate the great mass of citizens in such a way that thinking accurately about science is possible, if not quite second nature. The countervailing obstacle, however, is that widespread ignorance of science in and of itself prevents the development of an educational system that could dispel it.

It is clear that many or the left-wing thinkers whose ideas we find so unsatisfactory are, at bottom, obsessed by the same essential concern as the one we are now trying to address.

Paul R. Gross, former director of the Woods Hole Marine Biological Laboratory, is University Professor of Life Sciences and director of the Center for Advanced Studies at the University of Virginia. Norman Levitt is professor of mathematics at Rutgers University. They are the authors of Higher Superstition: The Academic Left and Its Quarrels with Science *(Johns Hopkins University Press, Baltimore, 1994).*

How do we democratize scientific and technological decision-making? How do we give the heretofore powerless some measure of control over the decisions, technological and otherwise, that so profoundly shape their lives? The unfortunate trajectory of academic radicalism has carried it to a position where this question is not so much answered as dispelled by a fog of philosophical conceits. Since science seems so difficult, so inaccessible and intimidating, when viewed on its own terms, the radical critics take the daring step of insisting that science can't be what it claims to be, no matter how well it backs up its claims with experiment and applied technology. Outwardly or covertly, they insist on supplanting standard science with other "ways of knowing" that, by their very nature, will be inclusive and welcoming. These ambitions are backed up by a "multiculturalism" insisting that science must be faulty because it has been done, for the most part, by white males; and by a kind of populism committed to setting New Age mysticism on a par with science because the former is so earnestly believed by so many well-meaning people.

The generosity of the democratic impulse when conjoined to this mode of thinking is instantly perverted to a kind of inverse intellectual snobbery, a form of coarse populism that is willing to exile the most stringent kinds of analytical thought and jettison the reliable devices of empiricism in the name of opening the doors of knowledge and driving the haughty priests of science from the temple. The theorizing done on behalf of this project is thus a species of incantation, a ritual rather than an argument. It does not conceive the need to examine science closely on the terms set by the logic of science because, in itself, that kind of examination would concede too much to the temperament and mind-set of the scientist. It would require precisely the kind of education, or self-education, that the critics, in the name of some kind of popular participation and empowerment, want desperately to prove superfluous.

Back-door utopianism, so characteristic of academic-leftist critics of science, is a sad and, ultimately, a woefully impatient business. Behind it stands the Romantic discontent that echoes perilously certain sentiments that were once recognized as reactionary. How much it will add, in the end, to the burden of outright superstition and ignorance that has always plagued the American democratic experiment, is difficult to say. It is plain, however, that the underlying disaffection is hostile to enlightenment as such, and not just—as the mandarins of this movement readily admit—to the Enlightenment. What is chiefly discouraging about its new ascendancy in academic life is the evidence it provides of a tradition of egalitarianism falling under the sway of obscurantism and muddle. We do not need to convict the paladins of the postmodern left of any particular superstitious foolishness, in the ordinary sense, to notice that they have an appalling tendency to condone such foolishness with a relativist nod and a deconstructionist wink.

Above all, the net effect of all this is to debase still further the already-corrupt coinage of public debate. The damage wrought by denatured language is all too apparent. Public health officials struggle to gain the credibility that should rightfully be theirs, and have to fight continually to be heard over a hubbub of voices stridently denouncing the arrogance of Western scientific and materialist paradigms, and offering to replace them with "alternative modes of healing" that promise to make us better faster and cheaper than stodgy old M.D.'s. At the root of it all is an ancient amalgam of quackery and self-delusion, but now the fashionable shibboleths of postmodern academic discourse are available to array the old foolishness in up-to-date scholarly language. Discussion of environmental questions is now, at least to some degree, hostage to a rhetorical style and a technique of public relations in which unrelenting ecobabble plays an increasingly peremptory role. The locutions "environment-friendly" and "environmentally sane" cover a broad range of styles, practices, and products of commerce that are neither of those. This, too, is a language fostered in large measure by the peculiar intellectual gamesmanship of the academic left, and it is as often as not employed for purely political purposes.

As we have seen, practical measures for making discussion of scientific issues effectively more democratic by what should be the straightforward process of extending scientific literacy are continually subverted by the intrusion of "identity politics" into the pedagogy of science. In the case of "Afrocentric" science education, the phenomenon is nothing less than garish, although it remains strangely immune to criticism. It is clear that black youngsters who aspire to scientific careers will be in deep trouble if their early education is dominated by the Afrocentrism espoused by a number of now well-known writers toward whom the universities of the country have proved unaccountably friendly.

The feminist critique of science is subtler and, superficially, less provocative in style; but it may, ultimately, have even more widely exclusionary results. Young women—or men, for that matter—who try to embark on scientific vocations with the explicit aim of reconstituting science along the lines advocated by some of the best-known feminist science-critics are on a course leading to frustration and disillusion. We are not imagining such young people: we encounter them regularly in our classes and note their encouragement by colleagues in certain departments.

"This 'academic left' . . . is by no means the same thing as the set of all academics with left-wing political views."

Science does not work the way the critics say it works, and the program of reforms mooted by the critics will turn it into something other, and less than, *science*. Enthusiastic recruits to the cause of "feminist" science will have to face this contradiction sooner or later—most likely sooner. They may come to take the view, shared by most women scientists of our acquaintance, that feminism, whatever its strengths as a moral stance and a social program, is not a methodology for doing science: it does *not* offer any privileged insights into scientific questions. That will be their victory. But if they attempt to hold fast to the most emphatic tenets of feminist dogma—for instance, the stylish assertion that "women" can't be "scientists" under the present order, because society constructs these as mutually exclusive categories, and therefore that scientific practice must be reconstituted along radical-feminist lines before women can participate—they will quickly find themselves effectively excluded from serious scientific work.

On the other hand, many women with scientific talent may not get even that far. They will be discouraged from the outset by the litany of the most prominent critics to the effect that science, as it is practiced, is innately antagonistic to women, that it reflects and embodies a system of "patriarchal" domination and "violent" subordination of nature. Thus, to the degree that this sort of thing actually happens, feminism will find itself in the position of frustrating an original, legitimate, and honorable feminist goal: that of augmenting the proportion, as well as the absolute number, of women in science.

We must also note that the left itself—not only the peculiar ideological tribe we have dubbed the "academic left," but the far broader and deeper tradition of egalitarian social criticism that properly deserves such a designation—is, potentially, one of the ironic victims of the doctrinaire science-criticism that has emerged, just as it has long been the victim of the worst kinds of Marxist, Leninist, and Stalinist cant. It is legitimate, for instance, to assert that socialist views have a place in the important debates about environmental questions. Without here endorsing—or rejecting—a socialist point of view, we appreciate that it exists and that it is distinguishable from alternative political visions. The underlying argument is that free-market capitalism, with its enthronement of profit and its tendency to insulate crucial economic decisions from democratic oversight, is, in itself, an obstacle to changes we should make in our uses of technology if we are to develop sound environmental practices. In itself, this is a view that can be argued and that cannot simply be dismissed without specific, and historically informed, criticism. If, however, "eco-socialists" are forced to carry the ideological baggage of the academic left—the relativism of the social constructivists, the sophomoric skepticism of the postmodernists, the incipient Lysenkoism of feminist critics, the millenialism of the radical environmentalists, the racial chauvinism of the Afrocentrists—then they will, in effect, greatly accommodate their opponents and facilitate the rapid dismissal of even their soundest points, for those will be embedded in a tissue of unscientific and antiscientific nonsense. Scientists, and the scientifically well-informed, will simply not accept any form of "socialism" whose agenda include the subversion of science.

"Science does not work the way the critics say it works, and the program of reforms mooted by the critics will turn it into something other, and less than, science."

We are not calling for a purge of institutions of higher learning in this country. We don't advocate supplanting one regime of "political correctness" by another, even more odiously high-handed one. Having made that disclaimer, however, we can in good conscience urge that certain forms of vigilance are appropriate, troublesome as they may be to preoccupied teachers and scholars. First and most important is the necessity of seeing to it that whatever is labeled "science education" in our colleges and universities deserves that designation. Science courses must teach science. It's as simple as that. They should have substantive scientific content, validated by perfectly well known and legitimate modes of scientific inference. As educators, scarred in battle and wearing a few tarnished medals, we have experience of the attempts to label shaky theorizing and tendentious quibbling as "science" for the sake of introducing them into the curriculum.

"Creation Science" is an example with which most of us are familiar, although institutions of higher education (outside of sectarian colleges of dubious legitimacy) were rarely the targets of that campaign. We have also the example of various New Age confections peddled at some community colleges and in extension programs, under the pretext that they represent "science" of some kind. But the influence of the academic left is of a different kind, since it is seconded by the support, often enthusiastic, of many established senior members of the academic community. To date, it has merely nibbled at the fringes of the "hard" sciences, although, as we have seen, such heretofore honorable fields as anthropology and psychology have been gravely contaminated. We cannot help but feel, however, that there will be many more calls for "feminist" courses in biology and "Afrocentric" courses in mathematics. How much force such campaigns will have is hard to predict. In any event, scientists and science educators must, on their professional

honor, be prepared to resist the insertion into the science curriculum of courses whose content is tailored to the demands of any ideological faction.

Beyond this, there is the matter of courses, seminars, symposia, and the like, that claim to address scientific matters while falling outside the official boundaries of science departments. We urge scientific professionals to scrutinize these offerings, whether or not invited to do so; to participate in them if possible, and with appropriate skepticism. We urge them not to fear making judgments, not to hesitate, for the sake of someone else's imagined good social intentions, to make their misgivings public. One can't assume in these matters that possession of an advanced degree or a professorship equates to intellectual legitimacy.

We realize, of course, that the greatest disincentive to participation in such controversies is the time and effort it takes, costs that will add greatly to the burden of sustaining a serious research program and fulfilling generously one's teaching responsibilities. Intellectually, these quarrels tend to be tiresome. Nature is the scientist's worthy adversary: we use the figure in defiance of the fact that science critics will sniff it out as evidence that we are slaves to the Western patriarchal paradigm of dominance and control. Academic leftists, on the other hand, tend to be unfocused bores, and a certain deliberate, cheerful, simple-mindedness is needed to hear them out sufficiently to catch the drift of the arguments and to formulate an apposite response. It is an unlikable chore, but one that a good many of us ought to be doing, out of loyalty to our own disciplines and to—forgive the thought—civilization. □

How Feminism Is Now Alienating Women from Science

NORETTA KOERTGE

"Instead of exhorting young women to prepare for a variety of technical subjects by studying science, logic, and mathematics, Women's Studies students are now being taught that logic is a tool of domination."

Twenty years ago the dominant mood of feminism could have been represented by the World War II poster of Rosie the Riveter. Activists were rolling up their sleeves and demanding access to traditionally male jobs. Women were no longer always willing to be nurses, or legal secretaries, or lab technicians. They were demanding the opportunity to be electricians, engineers, forest rangers, and astronauts—and gender stereotypes that implied that women couldn't deal with machines or think analytically were anathema to them.

A feminist Rip Van Winkle who fell asleep during the seventies would be amazed at the contrasting ethos prevalent within academic feminism today. The tough-minded and strong-armed Rosie Riveters have been displaced by moralizing Sensitive Susans, each desperately seeking to find a new ideological flaw in the so-called hegemonic discourse of patriarchal, racist, colonial, Eurocentric culture.

All of this might be cheerfully relegated to the Ivory Tower's already overflowing dust bins if one were not concerned about its impact on idealistic young women who are making curricular and career choices while struggling to construct lifestyles that will be quite different from those of their mothers and grandmothers.

As Daphne Patai and I interviewed faculty, students, and staff from Women's Studies programs for our book *Professing Feminism,* there emerged a complex picture of what we call "negative education"—a systematic undermining of the intellectual values of liberal education. And as Paul Gross and Norman Levitt have so impressively documented in *Higher Superstition,* it is the natural sciences that are under the heaviest fire.

Young women are being alienated from science in many ways. One strategy is to try to redefine what counts as science. For example, instead of teaching about the struggles—and triumphs—of great women scientists, such as Emmy Noether, Marie and Irene Curie, and Kathleen Lonsdale, feminist accounts of the history of science now emphasize the contributions of midwives and the allegedly forgotten healing arts of herbalists and witches. More serious are the direct attempts to steer women away from the study of science. Thus, instead of exhorting young women to prepare themselves for a variety of technical subjects by studying science, logic, and mathematics, Women's Studies students are now being taught that logic is a tool of domination and that quantitative reasoning is incompatible with a humanistic appreciation of the qualitative aspects

of the phenomenological world.

Feminists add a new twist to this old litany of repudiations of analytical reasoning by claiming that the standard norms and methods of scientific inquiry are sexist because they are incompatible with "women's ways of knowing." The authors of the prize-winning book with this title report that the majority of the women they interviewed fell into the category of "subjective knowers," characterized by a "passionate rejection of science and scientists." These "subjectivist" women see the methods of logic, analysis, and abstraction as "alien territory belonging to men" and "value intuition as a safer and more fruitful approach to truth" (*Women's Ways of Knowing,* by Mary Belenky et al., p. 71).

The authors, some of whom were trained as psychologists, admit that because of the high value Western technological societies place on objectivity and rationality, these women's ways of knowing have certain "maladaptive consequences," but they emphasize that even the most epistemologically mature women in their study continue to rely heavily on subjective experience. Even those they describe as "integrated knowers" have a need to "connect" in an empathetic way with the material they study. These women are uncomfortable with the idea of a detached, impartial observer; they dislike debates, and they find it impossible to separate a critique of ideas from a criticism of the people who hold them.

Given the traditional roles of nurturer and peacemaker ascribed to women, it is perhaps not too surprising that the researchers found these profiles, although one wonders how much such attitudes were reinforced by current feminism. But what is absolutely shocking to me are the conclusions that these feminists, who are presumably trying to better the lot of women, draw from their research. Instead of arguing that young women need special help in learning how to debate and deal with abstractions, instead of calling for studies of how best to alleviate math anxiety and science phobia, instead of deploring the forces that threaten to make many women innumerate and scientifically illiterate, the authors argue that society must simply place more value on "maternal thinking."

"Feminists add a new twist . . . by claiming that the standard norms and methods of scientific inquiry are sexist because they are incompatible with 'women's ways of knowing.'"

In addition to these generic repudiations of the methods of scientific inquiry, feminists have criticized the content of various sciences, taking a special dislike to biology. In our book we describe a series of recurring maneuvers that we call the game of *Biodenial.* Some feminists, for example, have claimed that the pain of childbirth is a social construction that would disappear in a more women-positive society and that the biological classification of human beings into two sexes is inspired by the political desire to clearly demarcate those who are to dominate from those who are to be oppressed. And of course there is the recurring talk about human parthenogenesis.

Once again it is difficult to imagine that even the perpetrators of these fantastical views take them seriously. Yet the effects are very real. Women who do decide to become scientists find themselves under attack from the self-proclaimed "echt" feminists, who call them "Athenas" and "Queen Bees." In many scientific disciplines, women are a tiny minority and find themselves in a climate where they could use a little feminist support as they seek to gain acceptance and equal treatment, but they may well not find it in today's feminist circles.

Even more troubling are the deleterious effects on the young women who buy into the feminist attacks on rationality and science. To give just one example: Traditional feminists often talked about the mysogynist elements in Freud's theorizing and pointed out weaknesses in his methodology—the case of Dora was a favorite example of how Freud browbeat clients in his attempt to find the repressed memories he "knew" were there. What a painful irony that today's feminists have so uncritically endorsed the methods by which hypnotists and psychological counselors purport to unearth repressed memories of childhood sexual abuse and Satanic rituals of the most bizarre kinds. I cannot think of a better demonstration of how the credulous trust of subjective beliefs and the dismissal of the methods and content of science can turn out to be dangerous to all involved.

Feminism has a great past and there remains much to be done to ensure that women really do have an equal opportunity in all aspects of society. What would our great feminist foremothers say about what's happening today—Harriet Mill, Susan B. Anthony, Elizabeth Cady Stanton, all of the women who fought for the right to go to college and enter med school, the women who couldn't get into Caltech or the Chemical Society or the Royal Society until a relatively few years ago? I think they would be proud of the gains women have made in this century, but it might break their hearts to see the strange doctrines now being promulgated in the name of feminism.

Editor's Note

Related reading: Barbara Walker, "Science: The Feminists' Scapegoat?" SKEPTICAL INQUIRER, 18: 68-72, Fall 1993. □

Noretta Koertge is professor of history and philosophy of science at Indiana University, Bloomington, IN 47405. She is co-author of Professing Feminism: Cautionary Tales from the Strange World of Women's Studies, *Basic Books, 1994.*

A Scientific Antidote to Fashionable Antiscience

KEITH M. PARSONS

Higher Superstition: The Academic Left and Its Quarrels with Science. By Paul R. Gross and Norman Levitt. The Johns Hopkins University Press, Baltimore, 1994. 328 pp. Hardcover, $25.95.

History's most notorious expressions of antiscience have largely issued from conservative, often religiously based ideologies. From Tertullian's railings against Aristotle to Bishop Wilberforce's unctuous anti-Darwinism, this generalization holds good. Many such episodes of reactionary antiscience were meticulously, if tendentiously, detailed in Andrew Dickson White's classic *History of the Warfare Between Science and Theology in Christendom.* Writing in 1896, White expressed the hope that sectarian opposition to science would be a thing of the past.

Today we are surprised at White's naivete. Surely, it seems, he could have seen that the forces of reaction were far from finished. The late twentieth century has seen a particularly nasty outbreak of reactionary antiscience in the form of "scientific" creationism. However, one thing White could hardly have foreseen is that, nearly a century after his writing, the most potent intellectual challenge to natural science would come not from the religious right but from the allegedly most advanced and progressive secular thinkers. White could not possibly have anticipated the astonishing vehemence with which many left-wing intellectuals have turned against the legacy of the Enlightenment.

Yet this is precisely what has happened. Many Marxists, feminists, literary critics, and environmentalists, including some of the most prestigious academics at leading universities, have issued sweeping attacks against the aims, methods, values, and claims of the natural sciences. These critics castigate science as a tool of Western, capitalist, male (all bad things) culture used to devalue, exploit, marginalize, or otherwise oppress the innocent. Science is arraigned with a remarkable variety of crimes: pollution, warfare. racism, sexism, and the general malaise of late-twentieth-century life. Worst of all, science is accused of setting up an intellectual hegemony—of arrogating for itself a title of epistemological superiority above other "modes of discourse" or "ways of knowing."

Scientists have largely ignored the left-wing antiscience polemics. Being pressed by important duties, they simply let the asses bray. All of this has now changed with the appearance of a very remarkable book: *Higher Superstition,* by Paul R. Gross, an eminent biologist, and Norman Levitt, a similarly eminent mathematician. This book is a brilliantly written and cogently argued reply to the recent attacks on science by left-wing academics. It is a devastating critique: Time and again the appalling scientific ignorance of the antiscientists is exposed. The grandiosity of their promises is mercilessly contrasted with the paucity of their delivered goods. The shallowness—indeed silliness—of their arguments is made glaringly evident.

For instance, social constructivism—or "cultural constructivism," as Gross and Levitt call it—is a current fad among the left-wing literati. According to this view, the knowledge-claims of science are not, as in the traditional view of science, constrained by nature, nor are they partial representations of nature. Rather, science is a set of interpretations, i.e., modes of *discourse,* constructed within a particular cultural milieu and constituted by the norms, rules, interests, biases, and assumptions of that concrete social context. As such, science, so it is alleged, has no more right to consider itself an "objective" means of representing reality than any alternative "mode of discourse" generated within a contrasting cultural milieu.

Gross and Levitt take on those who expound or presuppose such cultural constructivism. Thus, they expose

Stanley Aronowitz's fatuous invocation of the Heisenberg uncertainty principle as a prop for his constructivist view of science. The uncertainty principle is a cornerstone of quantum mechanics, perhaps the most successful scientific theory of all time. However, as constructed by Aronowitz, and innumerable New Age gurus, the uncertainty relations are transformed into a deep, metaphysical Uncertainty, an Uncertainty fraught with connotations of epistemological crisis and existential angst. The discovery of the uncertainty relations is thus taken to mean that physics has lost its claim to reliability and objectivity.

The reply of Gross and Levitt is as simple as it is devastating:

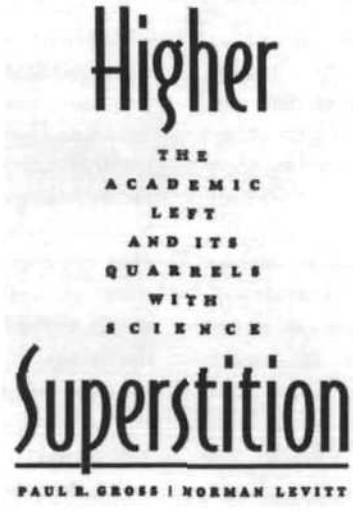
> Once obscurantism has been stripped away, we recognize that the uncertainty principle is a tenet of physics, a predictive law about the behavior of concrete phenomena that can be tested and confirmed like other physical principles. It is not some brooding metaphysical dictum about the Knower versus the Known, but rather a straightforward statement, mathematically quite simple, concerning the way in which the statistical outcomes of repeated observations of various phenomena must be interrelated. And indeed, it has been triumphantly confirmed. It has been verified as fully and irrefutably as is possible for an empirical proposition. In other words, when viewed as a law of physics, the uncertainty principle is a very certain item indeed. (p. 52)

In short, the formulation and confirmation of the uncertainty relations was a great triumph of physics. Aronowitz could hardly have picked a worse example to support his claims about the failure of scientific objectivity and reliability.

Gross and Levitt take on a more daunting task when they confront Jacques Derrida and his postmodern allies. Derrida is the doyen of "deconstructionism"—all the rage for the past decade or so in the circles of literary criticism. Deconstructionism is not so much a theory of criticism as a knack for the formulation of a ponderous and impenetrable argot.

Aronowitz, although silly, is at least comprehensible; the postmodern literary critics revel in obscurity.

Here, as with Aronowitz, the basic problem seems to be scientific ignorance combined with what Wittgenstein called "the bewitchment of thought by language." With Aronowitz the straightforward and unproblematic meaning of "uncertainty" in the uncertainty relations becomes a murky, metaphysical Uncertainty. Similarly, many literary critics have discovered a rich mine of metaphor in chaos theory. Of course their understanding of the physical principles of chaos theory is minimal, but this hardly impedes their vaporous musings about "nonlinearity." As in Michael Crichton's *Jurassic Park* (which is much more fun to read than any of the lit-crit stuff), the development of chaos theory is, astonishingly, construed as somehow spelling the end of scientific rationality. Such nonsense gets the treatment it deserves from Gross and Levitt.



Higher Superstition is at its best in dealing with the radical feminist critics of science. Gross and Levitt do not contest the claim, which is in fact undeniable, that women have not been accorded equal opportunity for education, careers, advancement, or recognition in science. However, academic feminists now push far beyond the legitimate quest for redress of these inequities. Such feminist science critics as Evelyn Fox Keller, Sandra Harding, and Helen Longino often imply that the scientific ideals of objectivity and disinterestedness, and the methods employed to secure those values, are somehow pejoratively masculine or patriarchal. They seek to reconstitute science from the ground up, replacing it with a new "feminist science." Gross and Levitt show that such efforts, when not entirely vacuous, amount to no more than an old-fashioned attempt to subordinate the findings of science to the demands of ideology.

Some of the most virulent antiscience on the present scene pours forth from the extreme wing of the environmental movement. Such groups as Earth First! and such movements as Deep Ecology and Ecofeminism combine vehement antiscience with goofy nature mysticism. Gross and Levitt show remarkable restraint and patience as they carefully rebut the back-to-Eden moonshine. They are especially effective in detailing how environmental alarmists appropriate the findings of science when science seems to confirm their apocalyptic warnings but grow silent or hostile when science questions their doomsday scenarios. As with the radical feminists, science is welcome only as a slave of the ideological imperative.

Although its criticisms are wickedly, and entertainingly, effective, *Higher Superstition* is far more than a mere polemic. Gross and Levitt provide acute analyses of the whole phenomenon of left-wing antiscience, tracing its roots and expertly spelling out its causes and motivations. After all, it is a genuine mystery why so many left-wing thinkers, in defiance of much of their own heritage, have rushed to embrace even the most *outre* refinements of French philosophy and New Age mis-

Keith M. Parsons has a Ph.D. in philosophy and is completing a second doctorate, in the Department of History and Philosophy of Science, at the University of Pittsburgh.

ology. Gross and Levitt provide explanations in terms of the countercultural roots, professional jealousies, and muddled ideals of many academics, as well as the totalizing tendencies of current left-wing orthodoxies. Considering the invidious and reductive sociological analyses to which science has lately been subjected, it must have afforded Gross and Levitt a mildly vindictive pleasure to thus turn the tables.

Yet Gross and Levitt are not wholly unsympathetic with their subjects. Indeed, they are rightly concerned about the comfort their book might give to Rush Limbaugh types for whom every feminist is a "feminazi" and every environmentalist is a tree-hugging fanatic. Such is not the position of Gross and Levitt.

The chief drawback of Gross and Levitt's book is that it probably will not be read by those who need it most. It is the fate of many good books to preach to the converted. However, this book may be unreservedly recommended to friend and foe alike. □

Bashing the Science Bashers

TANER EDIS AND AMY SUE BIX

◀ *Higher Superstition: The Academic Left and Its Quarrels with Science.* By Paul R. Gross and Norman Levitt. The Johns Hopkins University Press, Baltimore, 1994. 328 pp. Hardcover, $25.95.

Sociologists describing science as merely culturally constructed, with no more explanatory power than any myth. Postmodernists deconstructing the texts of science and revealing their illegitimate bases. Feminist critics of science exposing it as patriarchally corrupt to the core. Environmentalists denouncing science as destruction. Plus AIDS activists, animal rights advocates, Afrocentrists. In *Higher Superstition,* Paul R. Gross and Norman Levitt claim that a high degree of antiscientific thought has taken root in large sectors of academia outside of science and engineering and contend that these attitudes are intellectually baseless, yet pervasive and ultimately pernicious.

Many scientists and skeptics have become increasingly aware of negative views of science percolating through the wider intellectual culture, where a cognitive relativism predominates that makes Atlantis as well supported as Rome and where the knowledge products of science are tainted by the misuse of its applications and the injustices of the social order it serves. Examination too often reveals that the critics are only superficially acquainted with science and that they regularly resort to incoherent logic—points that Gross and Levitt emphasize.

While *Higher Superstition* presents a positive view of science, it is significant for its failings as well as for the many instances in which its defense of science is entirely on the mark. It may seem an unsympathetic review that dwells on the shortcomings rather than the strengths of its thesis, but this book exemplifies certain excesses to which cultural defenders of science are given. Smoothing these out is essential in order to maintain a debate that amounts to more than a clash of incompatible attitudes.

Specific flaws of the book range from the relatively minor to the more serious (repeating an out-of-context attack on philosopher Sandra Harding's provocative "[Newton's] rape manual" comment, which obscures its more valid criticisms about her feminist analyses of science). The overall problem, however, is that it emphasizes the sensational. Gross and Levitt present a rogues' gallery of inadequate thinkers who are parading assertions that are either patently ridiculous or mere political posturing. The result is that they have to resort to tendentious cultural or psychological accounts in explaining why such figures are taken seriously, even lionized. There is a certain satisfaction in turning hand-waving cultural "analysis" against itself, but such an exercise does not lead to understanding. Alongside the more ludicrous attacks, there are more worthy challenges to science that are deserving of attention. Although more comprehensive antiscience claims will not pass muster, advocates of science should be able to learn something from engaging in constructive dialogue with the more reasonable critics, while correcting some of their misconceptions in turn.

The chapters on cultural constructivism and the haphazard collection of attitudes called postmodernism are illuminating enough for the reader encountering these ideas for the first time. However, Gross and Levitt do not offer a detailed analysis, and they do not include any references to the incisive critiques of cognitive relativism in social science by Ernest Gellner, or deconstruction by John Ellis, to name just two. While the authors make an adequate case that the high status of

Derrida and Foucault followers is shameful, stopping there makes the argument all too facile. Readers would have been better served with more than just a hint about some more interesting (and ambivalent about science) philosophical positions on the postmodern periphery, such as those resulting from Richard Rorty's influence.

The authors would also have done well to briefly describe recent work in the history of science and technology that probes the complex interaction between science and society without becoming mired in the conceptual poverty of an extreme cultural constructivism. Deploring postmodern brain-death has its uses, but a book of this sort should attempt to provide a broader perspective as well.

With allegedly scientific demonstrations of female inferiority becoming favored alongside reliance on traditional myths, there is an understandable basis for feminist concerns regarding science. However, as Gross and Levitt's chapter "Auspicating Gender" notes, feminist criticism of science can get entangled in an analysis of metaphors and in clashing, ill-defined notions of "feminist science." Attempts to radically reconstitute science from a feminist standpoint can indeed lead to wretched philosophical excess. However, Gross and Levitt focus on misguided epistemological projects and ignore more substantial claims, such as those relating to historically pervasive gender (and racial) bias in certain areas of biology, and how these flaws produced a pattern of bad science (by usual standards).

Some feminist thought raises the worthwhile question: What does it mean if it took forces external to science—specifically, political movements like feminism—to gain the recognition of unsatisfactory practice? These are real issues, but Gross and Levitt dismiss them out of hand, preferring to caricaturize critiques like Anne Fausto-Sterling's and to ignore important historical considerations. The science-feminism relationship is more complicated than presented in this book, involving questions resolvable by real empirical and historical work, not just polemic on either side. Contrary to Gross and Levitt's position that the influence of feminism on science has been negligible, the recent conference on "Evolutionary Biology and Feminism" at the University of Georgia demonstrates that such fruitful approaches exist.

In discussing radical environmentalism, the authors point out how the scientific uncertainties in issues like global warming get ignored in the political process. The complexity of real environmental science makes its use in support of simplistic moral positions problematic. In this chapter, Gross and Levitt adopt a more charitable approach, acknowledging something of the ambiguities and range of serious opinions involved, while quite correctly targeting bizarre environmental claims like those from Jeremy Rifkin. Yet it is dismaying to discover in a footnote a favorable reference to Dixie Lee Ray, known for her hysterical (to use the kind of label Gross and Levitt favor) anti-environmentalist pseudoscience.

With "The Schools of Indictment" chapter, the book moves on to the sorrier aspects of AIDS activism (including conspiracy theories featuring scientists or Jewish doctors), animal rights, and Afrocentrism. Some of the nonsensical rhetoric generated about AIDS is infuriating in the face of real tragedy—inhabiting a postmodern world of pure verbiage becomes truly perverse in this case. However, Gross and Levitt do not show that this postmodern weirdness is all that significant in relation to AIDS; it appears to be more of an academic sideshow. Nor is it clear whether some activists' attitudes toward conventional medical practices grew out of an overall antiscience posture or out of a tendency to explore any alternative, however misguided, in a terrible situation. The pages on Afrocentrism closely depend on the work of Bernard Ortiz de Montellano, and present a strong case that advocates of honesty in science and history should be concerned about the popularity of unfounded assertions about Egyptian history and African paranormal powers. Still, this appears to be primarily a case of classic pseudoscience, with a veneer of cultural criticism of science that links it to the theme of the book.

Gross and Levitt conclude with some intriguing speculation about the roots of strange science criticism and with proposals for remedies. However, these are flawed by the authors' animosity toward the humanities. Faculty are more ideologically diverse than they are portrayed; furthermore, moderate institutional criticisms of science have been both more common and more successful than the radical ones on which the book focuses. Such work has aimed to open up the practice of science and to address the social complications of scientific advance. Even many of the more radical critics, mistaken though they may be, are not driven by an antiscience grudge, but by a democratic view of the social possibilities of science. Most important, nonscientists too are capable of distinguishing popular rhetoric from scholarship. While the authors berate others for their ignorance of natural science (not acknowledging the substantial scientific backgrounds of many within such disciplines as the history of science), they in turn underestimate the expertise necessary for scholarship in other fields. Particularly where complex issues of science and society are concerned, scientific expertise alone does not provide the requisite perspective and breadth of knowledge. The uneven track record of scientific institutions in confronting their failings (e.g., the Tuskegee syphilis experiment and the Dalkon Shield, to name just two medical examples) indicates that scientists may be too hasty if they follow Gross

Taner Edis has a Ph.D. in physics and manages the SKEPTIC E-mail discussion group; Amy Sue Bix is an assistant professor in the Department of History at Iowa State University and is associated with its Center for Historical Studies of Technology and Science.

and Levitt in attacking other fields.

Gross and Levitt consistently adopt an uncharitable approach, and their statements to the contrary ring false. Scientists and skeptics have good reason to be concerned about hostile perceptions of science, but indiscriminate attacks on criticism based on the worst examples available may well backfire. In defending science as a cultural entity and as an instrument for producing (usually) reliable knowledge, we are better off not drawing battle lines between black and white and adopting a crusade mentality. Among all the nonsense, there is much that is valuable, although not as visible, in current analyses of science. Ignoring this leaves defenders of science open to the charge that they are propagating their own brand of mythology about science. Scientists and skeptics should be productively engaged in these debates about science and society, where there is a real opportunity to contribute to the resolution of some tough questions. Claims about the impossibility of knowledge, or the evils of science, are extravagant, and *Higher Superstition* succeeds against these extremes. However, this should not obscure our need for critical thought about science as a social activity. □

The Antiscientific Left

GEORGE FISH

◀ *Science as Power: Discourse and Ideology in Modern Society.* By Stanley Aronowitz. University of Minnesota Press, Minneapolis, 1988. 398 pp. Hardcover $39.95; paper, $14.95.

◀ *Questioning Technology: Tool, Toy or Tyrant?* Edited by John Zerzan and Alice Carnes. New Society Publishers, Philadelphia, 1991. 222 pp. Hardcover $39.95; paper, $12.95.

In the nineteenth century, and well into the first half of the twentieth, the popular attitude toward science in the Western capitalist societies was positive. Science meant progress, both economic and social, and the rationalization of industrial and political decision-making. Science was enlightenment, positive knowledge, the key to a better future for one's children, and even the solution for a better life here and now.

Such was the well-nigh universal popular attitude toward science up to the bombing of Hiroshima.The Bomb showed another side to scientific discovery: the harnessing of science not to prolong and improve life, but to devastate and destroy it. The popular imagination was quick to grasp the import. Science could be a benign Athena, but it could also be a ravenous Moloch, a Moloch attended by an arcane priesthood of the new scientists, articulate men (few women) who were specialists and spoke their own language, parts of which filtered into general use. With the onset and continuation of the nuclear and conventional arms race between the United States and the U.S.S.R. this priesthood spawned a new elite of learned Cold War Ph.D.s talking of "scenarios," "megadeaths," and "winnable nuclear wars."

Then came the ecological disasters of the 1970s and 1980s, and new terms became part of everyday vocabulary, new terms of crisis and death: "Chernobyl," "Love Canal," "PCBs," "dioxin," "mercury poisoning," "greenhouse effect," and so on. It was now science that was inventing a new vocabulary of death, a death seemingly brought about by a rampant industrial and scientific technology, with pure science itself a willing handmaiden. The popular mind distrusted science more and more; and among pockets of intellectuals, this distrust moved to outright rejection. Especially strong within this movement were the intellectuals of the political, social, and cultural left. Their humanist vision impelled their critique of a science they saw become increasingly antihuman, a new, sterile theology of technological innovation for its own sake without regard for the human consequences.

And yet they could not be easily dismissed. Terms like Cherynobyl and megadeath spoke of a crisis in the use of science. But if science had become a Moloch, was it immutable? Could that Moloch become an Athena once again?

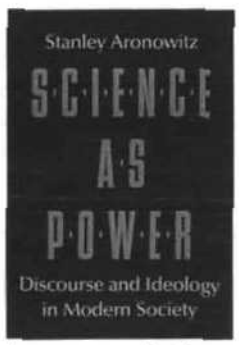
The antiscientific left said no. And it was felicitous. Two examples of this reasoning are before us: Stanley Aronowitz's *Science as Power,* and the anthology *Questioning Technology.* For those with critical sympathies toward science, these books are a challenge, and we must seriously ask, "What can they tell us?" Antiscientific criticism is not refuted merely by asserting claims of scientific orthodoxy.

Stanley Aronowitz is one of the leading U.S. proponents of postmodernism and one of the most authoritative postmodern critics of science, edu-

cation, and culture. It is this postmodernist vision that infuses *Science as Power*, as he attempts a critique of the validity of science by attacking its supposed foundations. He sees science directly challenged, and even refuted, by feminism and radical ecology, with their paradigms of a holistic Nature that cannot be broken down and analyzed piecemeal. To Aronowitz, science is just another ideology, another "discourse" (to use the postmodernist term), that is countered in the relativistic universe by other discourses. Thus, science has no absolute claim to truth.

Indeed, science leads to pernicious results. Aronowitz is especially alarmed by the progress in molecular biology, which he sees as leading to a strict chemical determinism. Yet, Aronowitz's criticism would seem to rest on a misunderstanding of determinism and determination.

We can illustrate this matter by the reader's constructing a truncated tree diagram. Start by making a point on a piece of paper. Call this point A. Then draw two diagonal lines from point A upward, one to the left and one to the right, and label the endpoints B and C. Do the same with points B and C to form points D, E, F, and G. From points D, E, F, and G repeat the process to form points H, I, J, K, L, M, N, and O. The process, obviously, can be carried out indefinitely. Now go back to point A and form paths by choosing at each point to go either to the left or to the right, and follow that path to the next point, and carry on the process, at each point choosing whether to go to the left or to the right, and going to the next point. It soon becomes apparent that a path resulting from motion in one direction precludes paths resulting from motion in the other direction. For example, because the path we chose was ACFM . . . , we are thus precluded from moving along paths ACFL . . . , ACGN . . . , ABEK . . . , and so on. But we could move along them, or others, with different choices, which would preclude ACFM . . . , and other paths! Thus, we have a simple "deterministic" model with many choices of outcome.



George Fish describes himself as a Marxist writer in Indianapolis.

But the very biology that Aronowitz so distrusts negates his fear of robotlike determinism. Consider that the polypeptides, the building blocks of proteins, are 99 percent the same between chimpanzees and humans. But what a difference that 1 percent makes!

Aronowitz also holds to the "open-endedness" of scientific debate. That is, the same controversies continue to recur, and are never settled. Throughout *Science as Power* he constantly refers to the debates of the 1920s and 1930s on the meaning of quantum physics, as though later experiments and theorizing never settled the matters. Aronowitz's science seems to be frozen in a timewarp and somehow is never cumulative. Not only is such an approach ahistorical; it flies in the very face of actual scientific history.

But most of all, Aronowitz is a humorless ideologue, and *Science as Power* is less an investigation than it is a lawyer's brief. Science holds no mystery, no awe for him. He has escaped the sublime beauty of the "Aha!" phenomenon; and in the most fundamental sense his approach to science is scholastic. He has no comprehension that people can find joy in scientific discovery and explanation, that science is more than just some turgid litany of facts. The joy of science that was so well captured by Michael Crichton in his novel *Jurassic Park* as he recounts the ruminations of a scientist: "It was a complex, dynamic process which she never ceased to find fascinating. And which she knew most people simply didn't understand."

And in that regard, Stanley Aronowitz, despite his erudition, is like most people: he simply doesn't understand.

Which brings us now to *Questioning Technology*, which could be considered applied Aronowitz. An editorial project can be done well, poorly, or mediocrely. *Questioning Technology* is done the last way. The selections are very much a mixed bag, some quite worthwhile, others fluff and rant, all organized by editors John Zerzan and Alice Carnes as a brief against technology in favor of what they call "anarchy." But fortunately, with no exceptions, all of the selections are more erudite (even when wrongheaded) than the editors' commentaries, which are shrill. A serious trouble with *Questioning Technology* is that most of the selections are simply too short, the longest only ten pages, so that they become little more than literary sound bites. Also, the book is irritably marred by the American publisher's (New Society) decision to bracket every use of what it considers sexist language, and such didactic and even pretentious brackets are very numerous.

At bottom, the editors, through the connecting thread of their commentaries, seem determined to mold *Questioning Technology* into an anthologized polemic. But a number of their selections resist that, and the book becomes not only informative, but, with critical reading, even a skeptical tonic subversive of the editors' intent.

So, while *Science as Power* and *Questioning Technology* are less than convincing in their toxins against science, the thoughtful scientific-minded are still left with the indelible impression that all is not well. Aronowitz and the selections and commentaries of *Questioning Technology* can at a high enough level of intellectual abstraction be found to be logically questionable, but the sense of unease and even underlying fear that animates them is not so readily dismissed.

Paraphrasing a well-known Jewish itinerant preacher, "Man does not live by logic alone." And when logic doesn't translate into concern for humanity, the whole of humanity, the poor and oppressed as well as the rich and powerful; when the very physical environment we rely on to sustain our existence is thoughtlessly regarded as a means to technological ends no matter what the consequences; and when it seems that scientific and technological advances more and more depersonalize us and render us most conveniently treated as objects, then something is very wrong. And it demands of us, especially the thoughtful science-minded, that we cry out.

For science and technology cannot be separated from the societies that spawn and use them. Science and technology are not to be put into tidy, positivist boxes. People are not technical and industrial problems, to be solved accordingly. Recall the technologically advanced society that tried this, that treated the extermination of the Jews as just another industrial problem. And it used one of the advanced technologies available—the one that made gas ranges possible for every home and apartment—to create crematoria for the mass-produced Jewish corpses! At bottom, that is probably what Aronowitz and Zerzan and Carnes are trying to make us aware of. They don't do a particularly good job of it; but they deserve applause for their efforts and unstinting criticism of their failures. □

New Books

How to Think About Weird Things: Critical Thinking for a New Age. Theodore Schick, Jr. and Lewis Vaughn. Mayfield Publishing Co, 1280 Villa St., Mountain View, CA 94041. 320 pp. $18.95, paper. A valuable, well-packaged primer on dealing with claims of the paranormal, the supernatural, and the mysterious. Who are we to believe? How do you decide which claims are credible? What distinguishes rational from irrational claims? The authors help answer those questions. Their emphasis is on explaining principles of critical thinking that enable you to evaluate any claim for yourself. They supply or reprint analysis of many extraordinary claims but keep the focus "on carefully wielding the principles, not whether a given claim goes unscathed or is cut down."

Learning, Remembering, Believing: Enhancing Human Performance. Daniel Druckman and Robert A Bjork, Editors. National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418. 1994. 420 pp. $39.95, hardcover. The third report of the National Research Council's Committee on Techniques for the Enhancement of Human Performance. The first two were subject of widespread commentary and of articles or summaries in *SI,* partly because they examined parapsychology and some fringe claims. In this third book the committee examines recent research in learning, memory and cognition, emotions, and social and team processes. One section evaluates techniques that have been subject of strong claims of effectiveness: hypnosis, restricted environmental stimulation, meditation, and sleep learning. The report confirms some ideas and debunks some myths in exploring the workings of the human mind.

The UFO Mystery Solved. Steuart Campbell. Explicit Books/Lavis Marketing, 73 Lime Walk, Headington, Oxford 0X3 7AD, U.K., 1994. 208 pp. $20 (+ $3.50 surface postage or $7 airmail postage), paper. In answer to the question "What, in fact, have people who report seeing 'UFOs' seen?" a skeptical investigator searches for a single, archetypal cause for UFO reports and their particular character. He emphasizes that he is dealing with "UFO reports," not "UFOs." After examining a variety or sources of deception and illusion, Campbell settles on the "astronomical mirage hypothesis"—mirages caused by the moon, bright planets, and stars—as explanation for a surprising number of famous UFO cases. The solution involves both astronomy and meteorological optics, and he contends that a lack of specialists with expertise in both has hindered examination by professionals. He provides extensive case-study evidence in support of his hypothesis.

Wondrous Events: Foundations of Religious Belief. James McClenon. University of Pennsylvania Press, 418 Service Drive, Philadelphia, 1994. 281 pp. $18.95, paper. Social scientist employs an experience-centered approach to examine the relationship between "wondrous events"—extrasensory perception, apparitions, out-of-body and near-death experiences, sleep paralysis, psychokinesis, firewalking, psychic surgery and spiritual healing—and the foundations of religious belief. His study of more than a thousand anomalous experiences from cultures worldwide indicates that they transcend culture. McClenon contends that these supernatural experiences play an important role in the development of religious ideologies.

—Kendrick Frazier

Articles of Note

Asimov, Janet and Isaac. "Essay 400: A Way of Thinking." *Fantasy & Science Fiction,* December 1994, pp. 114-131. Isaac Asimov had written 399 science essays in this remarkable series but was too ill before his death to write the four-hundredth. Here his wife Janet puts together the four-hundredth essay from their discussions and letters and an excerpt from his recent autobiography, *I, Asimov.* Starting with a Carl Sagan quotation, "Science is much more than a body of knowledge. It is a way of thinking," it is filled with Asimov's passion for science, his joy of learning (and educating others in its pleasures), and his disgust with pseudoscience.

Barnett, Arnold. "How Numbers Can Trick You." *Technology Review,* 97 (7): 38-45, October 1994. Examples from the media of how statistics can be used misleadingly, or simply incorrectly.

Blackmore, Susan. "Alien Abduction: The Inside Story." *New Scientist,* November 19, 1994, pp. 29-31. Reviews the various neurophysical stimuli and responses that may lead to experiencing feelings of abduction by aliens. Describes experiments by Michael Persinger in which magnetic pulses mimic the firing patterns of neurons in the brain's temporal lobe and create intense emotional and perceptual effects.

Blackmore, Susan. "Minds Possessed." *Nature,* 372:290, November 17, 1994. Positive review of Jim Schnabel's *Dark White: Aliens, Abductions and the UFO Obsessions.* "It is not a question of whether or not the aliens exist but of what the experiences have to tell us about our minds and brains," says Blackmore.

Crews, Frederick. "The Revenge of the Repressed." *New York Review of Books,* Nov. 17, 1994, pp. 54-60. Lengthy essay/review of Elizabeth Loftus's *The Myth of Repressed Memory,* Richard Ofshe and Ethan Watters's *Making Monsters,* Lawrence Wright's *Remembering Satan,* and three other books about the "recovered memory" movement. Asks, since the very concept of repression stands in doubt, how can one determine authentic cases of repressed memory? First of two articles.

Emery, C. Eugene, Jr. "Therapeutic Touch: Healing Technique or New Age Rite?" *Providence Sunday Journal,* November 27, 1994, pp. A1, 24. Detailed investigative report into therapeutic touch as increasingly used (or misused) by nurses at the University of Rhode Island and nationally. Thoroughly researched article reports on widespread experiments and evaluations showing that TT, which invokes "invisible energy fields," is doing nothing more than tapping the imaginations of the people who practice it and receive it. A sidebar reports on the challenge to the Colorado Board of Nursing by the Rocky Mountain Skeptics on teaching of therapeutic touch to University of Colorado nursing students.

Fabrega, Horacio, Jr. and Hugo Nutini. "Sudden Infant and Child Death as a Cultural Phenomenon: A Tlaxcalan Case Study." *Psychiatry,* 57 (3): 225-243, August 1994. In rural Mexico sudden infant deaths are attributed to witchcraft. The authors identified 47 such deaths and examined how blaming witches helped families to deal with guilt and trauma.

Hoover, Daniel W., and Richard Milich. "Effects of Sugar Ingestion Expectancies on Mother-Child Interactions." *Journal of Abnormal Child Psychology,* 22:4. 1994, pp. 501-515. Study tested hypothesis that commonly reported negative effects of sugar on children's behavior may be due to parental expectancies. Mothers who were told their sons had been given sugar in the experiment rated their children's ensuing behavior as more hyperactive than mothers told their sons had been given a placebo (aspartme). Actually, all had been given the placebo.

Jaroff, Leon. "A No-Touch Therapy." *Time,* November 21, 1994, pp. 88-89. Recounts the growing skepticism and criticism (especially by the Rocky Mountain Skeptics) of the therapeutic-touch fad in nursing schools.

Kelly, I. W., and D. H. Saklofske. "Psychology and Pseudoscience." *Encyclopedia of Human Behavior,* vol. 3, 1994, pp. 611-618. Discusses the role of scientific psychology in understanding behavior, the role of theory in science, and the scientific method. Contrasts them all with pseudoscience, with astrology as an example.

Kuznick, Peter J. "Losing the World of Tomorrow: The Battle over the *Presentation of Science at the* 1939 New York World's Fair." *American Quarterly,* 46 (3): 341-373, September 1994. The theme for the World's Fair was "Building the World of Tomorrow," but left-leaning science educators were pushed aside in favor of a celebration of corporate-sponsored applied science.

Larson, Erik. "Darwinian Struggle: Instead of Evolution, a Textbook Proposes 'Intelligent Design'" *Wall Street Journal,* November 14, 1994, pp. 1, 7. Good article on the ploy by creationists to package their antievolution campaign under the euphemism "Intelligent Design," exemplified in their book *Of*

Pandas and People. Critics say the book's mission is to sneak creationism past a 1987 Supreme Court decision barring public schools from teaching "creation science."

Mayor, Adrienne. "Guardians of the Gold." *Archeology,* 47 (6): 53-59, November-December 1994. The griffin, gold-guarding monster of legend, may have been inspired by the fossils of dinosaurs like protoceratops, which are still found by gold miners in Central Asia. Well illustrated.

McArthur, Benjamin. "The New Creationists." *American Heritage,* November 1994, pp. 106ff. An interview with Ronald L. Numbers, the scholar who has studied creationism as a social/historical movement.

Meades, Jonathan. "The Devil's Work." *Times* (of London) *Magazine,* 36-44, October 29, 1994. The surviving monuments to the Third Reich show its leaders' desire to create new sciences, history, and prehistory (even a pseudo-Stonehenge) in their image. Himmler's SS did "scientific" research in such areas as dowsing, archaeology, hollow-earth and Atlantis theories, etc.

Roslund, Curt, and Claes Beckman. "Disputing Viking Navigation by Polarized Skylight." *Applied Optics,* 33:21, July 20, 1994, pp. 4754-4755. An astronomer and ophthalmologist demonstrate that the notion that the Vikings utilized polarization of skylight on overcast days for navigational purposes has no scientific basis.

Sagan, Carl. "Channeling and Faith Healing—Scam or Miracle?" *Parade Magazine,* December 4, 1994, pp. 10-11. Article warns against credulous acceptance of faith healers. Acknowledges that there are some diseases in which the state of mind may play a key role and that faith and mental attitude may relieve some symptoms, but emphasizes that that is different from arresting the progress of serious disease. Describes Randi's "Carlos" hoax in Australia, which demonstrated how readily public and media would accept the claims (entirely bogus) of a supposed psychic faith healer (a Randi colleague). Also reports on the experiments of physician William Nolen, who did follow-up checks on people whom faith healers had claimed to cure and found not one cure of any serious organic disease. Concludes Sagan: "If we don't want to get taken, we need to develop skeptical habits of thought."

Schnabel, Jim. "Puck in the Laboratory: The Construction and Deconstruction of Hoaxlike Deception in Science." *Science, Technology, and Human Values,* 19 (4): 459-492, Autumn 1994. Hoaxes are sometimes used to reveal errors or incompetence in science. Schnabel examines five examples (including N-rays, crop circles, and Randi's Project Alpha) and considers what criteria are used to judge the validity of the hoax.

Underwager, Ralph, and Hollida Wakefield. "Untying the Gordian Knot: A Return to Reason." *Issues in Child Abuse Accusations,* 6:4, 1994, pp. 1-6. The Country Walk case in Miami, in which Ileana Fuster confessed, is often used as an example of a day-care case where bizarre, ritualistic abuse was, in fact, corroborated. Recently, evidence has surfaced that her confession was most likely false and was elicited by highly coercive procedures over the two years she was in solitary confinement prior to trial.

Wallstin, Brian. "Aggie Alchemy." *Houston Press,* April 7-13, 1994, pp. 7-9, 11-12. Journalistic investigation into the Philadelphia Project, in which Texas A&M chemistry professor John Bockris (who also made claims of finding cold fusion) got involved with a confidence man and claimed that a way had been found of converting mercury into gold—a form of modern alchemy. "At first, the Philadelphia Project was a promise taken seriously and with hope. Today, it just might be the greatest Aggie joke of all time." This was just the latest such episode in a long career in which, say the authors, "Bockris starred at a number of news conferences, many of them based on flamboyant exercises in scientific miscalculation only a touch less odd than alchemy."

Wernick, Robert. "Don't Look Now—But All Those Plotters Might Be Hiding Under Your Bed." *Smithsonian,* November 1994, pp. 108-124. A look at the public fascination with conspiracies, real and imagined. Conspiracy theorists have a penchant for paranoia; real conspiracies have actually changed the course of history.

Winter, Alison. "Mesmerism and Popular Culture in Early Victorian England." *History of Science,* 32 (2): 317-343, September 1994. In the 1830s the reaction to Mesmerism—a form of hypnotism—helped define what was orthodox medicine and what was "fringe." Includes a detailed description of John Elliotson's studies of Elizabeth O'Key.

—Kendrick Frazier and Robert Lopresti

Quoteworthy

"I would love it if there were aliens here, even if they are a little short, sullen, grumpy, and sexually preoccupied. So, if they are harbingers of an advanced civilization and they're here for heaven's sake, let's find out about them. My mind is open. . . . People make mistakes, people misapprehend natural phenomena, people look for attention, money, or fame. People sometimes experience alternative states of consciousness—hallucinations are very common in all human beings, including normal people. And with that as the background, to really believe one of these cases you need really good physical evidence. And there is none."

—Carl Sagan,
at a news conference at
the CSICOP conference in Seattle,
June 22, 1994.

Is Quantum Cosmology Science?

RICHARD A. CROWE

As I read through Ralph Estling's Forum piece in the Summer 1994 *SI*, I found myself simultaneously amused and dismayed. On the one hand, Estling pointed out in an entertaining fashion that dogma is just as capable of rearing its undesirable head in science as in other human endeavors. He warned us to be wary of the pronouncements of scientists when they leave the realm of science and venture into the shaky domain of metaphysics and quantum philosophy.

Although these ideas are not new, they are certainly worth repeating in a scientific era, when theoretical advances sometimes outstrip experimental evidence. On the other hand, Estling expressed strong skepticism of quantum cosmology without presenting any reasoned arguments other than the long-discredited objection "How could the universe arise out of nothing?" (For a discussion, see "The Universe: The Ultimate Free Lunch," by Victor Stenger, in the *European Journal of Physics*, 11 [1990] : 236-243). He criticized quantum theorists for getting too metaphysical; but then instead of directing his criticisms at those who advocate that quantum mechanics implies synchronicity and purpose to the universe, he heaped scorn on quantum cosmology. He also seems to have confused quantum genesis theory with inflationary models, which make predictions testable against observations (such as the microwave background or galactic peculiar velocities).

Estling also suggested, unjustifiably so, that quantum theory has become dogma. If he were to sit in on one of my modern physics courses, he would find out that the mystifying nature of the quantum world has been tested and verified repeatedly by direct experiment (cf. "Quantum Philosophy," by John Horgan, in *Scientific American*, July 1992, pp. 94-104). This is not myth-making, and quite definitely qualifies as science; the universe does not necessarily conform to our preconceptions. Moreover, we have learned to make practical use of quantum effects in semiconductor and microprocessor technology, microscopy, superconductivity, and SQUIDs, to name just a few areas. The agreement between quantum theory and experiment is one of the great triumphs of modern physics, Estling's opinions notwithstanding. Yet he is in good company, since even Einstein had difficulty accepting quantum "reality." Says theorist Daniel Greenberger: "Einstein said that if quantum mechanics is right, then the world is crazy. Well, Einstein was right. The world is crazy."

Granted, the connection between quantum physics and cosmology is not as secure. Nonetheless, since the discovery of the cosmic microwave background radiation (CMBR) in 1965, cosmology has become an empirical science, and there is observational evidence *consistent with* the quantum genesis model for the origin of our universe. A particularly useful discussion of these concepts can be found in "Quantum Cosmology and the Creation of the Universe," by Jonathan Halliwell (*Scientific American*, June 1991, pp. 76-85). Basically, the hot big-bang model (supported even more strongly now by intensity fluctuations in the CMBR observed by the COBE satellite), despite its many predictive successes, left some features of the present universe unexplained.

These gaps in the hot big-bang model have been filled by the inflationary model, which proposes that the universe ballooned by a factor of 10^{50} to about the size of a grapefruit in 10^{-32} seconds, an incredibly brief instant during the big-bang expansion. To quote Halliwell, "inflation improves dramatically on the hot big-bang model in that it allows for the currently observed state of the universe to have arisen from a much broader, far more plausible set of initial conditions." Although cosmic inflation is only a model, it is a testable modification to the big-bang scenario, which has empirical support. Only two or three parameters are needed to completely

describe the broad evolution of the universe through the inflationary era.

What about the more speculative quantum genesis, which would have preceded the inflationary era? Let me start by saying that many people believe that everything in nature has to have a causal explanation. Although this may be true at the macroscopic level, it is not necessarily the case at the microscopic level, as quantum physics has demonstrated. Transitions, decays, and nuclear reactions do sometimes occur spontaneously without apparent cause. Similarly, the universe itself does not require a cause.

In quantum mechanics, a system can never have an energy of exactly zero, and a "wave bundle" of nonzero energy (though empty of matter) is something, and not "nothing." The universe at this early stage can be described as a superposition of waves because it has energy density. In other words, "nothing" in the case of the universe means that it could start out as a vacuum of negative pressure (negative spacetime curvature) having the lowest possible energy state (ground state) consistent with the Uncertainty Principle. A negative pressure would allow it to expand in volume and increase its internal energy by doing work on itself, thus satisfying total energy conservation at each moment in time. There is no violation of the first law of thermodynamics. As the expansion continues through the Planck time (10^{-43} seconds after genesis) and then the inflationary era (which begins 10^{-35} seconds after genesis), a phase transition occurs at some critical temperature (about 10^{27} K). At this point, rapid inflation would give way to more leisurely positive-pressure expansion, and the internal energy of the universe would stop increasing and then decline.

If we recall Occam's Razor, the quantum genesis concept is compelling because the initial assumptions for the inflationary model are reduced to one

simple boundary condition for the "wave function" of the universe (the physical state of its "wave bundle" as described in the language of quantum mechanics). This condition gives a high probability of a classical universe emerging and growing to a large volume with very low energy density. In this scenario, once our universe grows beyond about 10^{-33} centimeters in size (the Planck scale), 10^{-43} seconds after quantum genesis, it evolves classically and can be completely described by General Relativity (GR). Prior to that moment, it cannot be described by GR, which tells us that within the Planck scale, space becomes "infinitely small" and energy density becomes "infinitely large." To describe the precise physical conditions (e.g., temperature, density, volume) requires a quantum theory of gravity that is still forthcoming (although superstring theory shows some promise here). Although the inflationary model is consistent with GR, quantum genesis clearly is not.

How can the quantum genesis model be tested? Direct observational tests are difficult, but not impossible. Quantum genesis models should produce gravitational waves, which interact very weakly with ordinary matter; the spectrum of such waves should, therefore, be preserved from their creation. Although attempts to date have failed to detect gravitational waves, new, more sensitive detectors are being built at present. We may not yet be able to definitively answer the question "Where did our universe come from?" But, to quote Halliwell, ". . . through quantum cosmology, we have at least been able to formulate and address the question in a meaningful—and most interesting way."

Cosmologists, like other scientists, construct mathematical models to account for observed features of the universe; testing these models by making predictions is part of the process of doing good science (the big-bang model is a successful example). Cosmology is an area of science that has been more speculative than others, simply because of the difficulty of doing direct observations (looking far out in space means looking far back in time). There is perhaps no more elegant mathematical model than General Relativity Theory, yet Einstein was convinced of its correctness long before it had ever been tested. Would Estling have suggested, in light of this, that Einstein was not a scientist? In some areas (like particle physics), scientists formulate new theories (like supersymmetry) that have very minimal or even no observational support, because direct experiments with the object(s) being tested or examined (like the early universe) may not be possible. As long as we are nondogmatic about what we think we know about the universe (and that includes cosmologists and quantum theorists), there is still a lot of room for good science. I'm quite sure that Einstein would agree. □

Richard A. Crowe is associate professor and chair, Department of Physics and Astronomy, University of Hawaii at Hilo, Hawaii 96720-4091.

Science *from page 16*

as recently disclosed by space probes, about the awesome wonders of the stars, of the billions of galaxies each containing billions of suns, of clusters of galaxies, and superclusters fleeing from each other as the universe expands from its incredible origin in the explosion of a tiny point some 15 billion years ago.

> *And all of this vision—far beyond* the scale of human imaginings—was made possible by the works of hundreds of learn'd astronomers. All of it; *all* of it was discovered after the death of Whitman in 1892, and most of it in the past twenty-five years, so that the poor poet never knew what a stultified *and limited beauty he observed* when he look'd up in perfect silence at the stars.
>
> Nor can we know or imagine now the limitless beauty yet to be revealed in the future—by science. □

Prognostications *from page 17*

damage or casualties, struck on this date, it was hailed as a fulfillment of the prophecy. The last we checked, the world still had plenty of sin.

But don't give up on the eschaton merely because the world has survived into 1995. Leland Jensen of Missoula, Arkansas, says that he is the Second Coming and that during 1995 the earth will suffer great meteor impacts, earthquakes, and major planetary changes. Those lucky enough to survive all this will enjoy Heaven on Earth. And, according to a story in the *Washington Post* (March 12, 1994), followers of the Institute of Divine Metaphysical Research expect the world to end in an instant, by 1996. So the end may come while you are reading this page. Fortunately, even if these people are right, they won't be in a position to gloat about it!

Meanwhile, progress in the esoteric sciences has been occurring so rapidly that it's difficult to keep up. The latest miracle substance seems to be "colloidal silver," said to be "the best all-around germ fighter we have," which costs $75 a bottle. According to certain of its distributors in California, colloidal silver is "known to be effective against more than 650 diseases"—including everything from acne and AIDS to yeast infections—"without any known harmful side effects or toxicity to the body." Actually, colloidal silver is an old nostrum whose use by doctors and pharmacists was discontinued after 1938, when the FDA mandated that drugs be proved "safe" and "effective." Other "alternative practitioners" offer such exciting elixirs as "ghost gold," said to consist of "orbitally rearranged monoatomic elements" that not only cure disease but restore your DNA to "its perfect state."

And a new system of personality assessment bids fair to displace horoscopes, at least for women: *lipstick analysis,* the determination of personality types by the shape of their pocket lipstick. According to a story in the *Milwaukee Journal* (August 14, 1994), Cynthia Christ of Sensa Cosmetics in Houston, Texas, has discovered how eight different personality types are reflected in the tilt of their lipsticks. If the tip is rounded to a point, its owner is "lovable," "family-oriented," and "needs people around." A sharp-angled tip is the mark of one who is "opinionated," "high-spirited," and "argumentative," while a flat top that is concave indicates one who "makes friends easily," is "inquisitive" and "exciting," and "makes a great detective." Reporter Lois Blinkhorn did her own little informal survey of her co-workers and found that their lipsticks matched their personalities amazingly well. "Lipsticks don't lie." □

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Letters to the Editor

Examining Stevenson's reincarnation cases

Leonard Angel's "Empirical Evidence for Reincarnation?" (*SI*, Fall 1994) is a valuable addition to the literature on reincarnation. However, in downplaying the contributions of earlier critics, he makes a number of statements that have to be challenged.

1. Angel claims that he is the first person to offer a critical examination of one of Stevenson's cases. This is not true. I know of at least two detailed discussions of Stevenson's cases. J. Fraser Nicol's review of Stevenson's *Cases of the Reincarnation Type*, vol. 1, in the September-October 1976 *Parapsychology Review* contains a full critical discussion of one of Stevenson's cases, and the same is true of Chapter 23 of B. N. Moore's *The Philosophical Possibilities Beyond Death* (Charles C. Thomas, 1981).

2. Angel objects to my references to C. T .K. Chari's criticisms of Stevenson's cases as cultural artifacts on the ground that Chari is himself a parapsychologist. This is preposterous. Nobody else has shown so convincingly how the "evidence" of Stevenson's cases is manufactured by ardent believers who can easily fool themselves and Western visitors. The fact that Chari is himself a parapsychologist is irrelevant and in no way detracts from the value of his articles.

3. Angel attributes to me the view that the "reincarnation hypothesis is highly improbable." This is a total misunderstanding of my position. I regard reincarnation as conceptually incoherent, and hence it can be neither probable nor improbable. It is conceptually incoherent because it has to rely on such nonsense notions as "soul travel" and "womb invasions" by the soul or the astral body. If this is so, then Stevenson's cases cannot possibly be evidence for reincarnation. They and various arguments for reincarnation are nevertheless worth discussing because numerous intelligible claims are also made by reincarnationists that are also false and improbable, such as that consciousness can exist without the brain. The situation is very similar to belief in God, conceived as a Pure Mind. Along with many other philosophers, I regard such a view as incoherent, but this does not mean that one should not examine the arguments for the existence of God. Various interesting questions come up in this connection, such as the meaning of "exists," the possibility of infinite causal series, and the alleged universality of religious need. These are intelligible questions, even though belief in God is not.

In my series of four (not three) articles in *Free Inquiry*) 1986-1987, I could not do justice to all angles of a very complex subject. I have tried to do this in my forthcoming book, also titled *The Case Against Reincarnation*, to be published by Prometheus in the second half of 1995.

Paul Edwards
New School for Social Research
New York, N.Y.

In his "Empirical Evidence for Reincarnation?" Leonard Angel does an excellent job, showing that even Ian Stevenson's supposedly most impressive case provides evidence altogether insufficient to establish that a presently living person has been enjoying true memories of the life of someone previously deceased. But suppose that Ian Stevenson or anyone else actually had succeeded in producing such evidence, and not just one most impressive case but many. Would this really constitute empirical evidence for reincarnation?

Certainly this, if it happened, would constitute something paranormal. But the most economical account of such phenomena, if they were to occur, would be in terms, not of reincarnation, but of paranormal retrocognition.

The simplest way of making clear that this is so is to think of those "out of body" experiences (OBEs) that some patients report having had while lying apparently unconscious on their hospital or other beds. The only reason for regarding OBEs as anything other than some sort of perfectly ordinary dreams is that some OBEs are alleged to contain information not normally available to their patients. Suppose now that there actually were such cases that could not be satisfactorily explained away. Then the most economical account of those phenomena would again be: not in terms of journeys by hypothetical and presumably immaterial entities (in this case, pretty short journeys in terms of both time and space), but in terms of the acquisition of the not normally available information by the patients' hypothesized paranormal powers of extrasensory perception (ESP).

This account is more economical since it hypothesizes only—only! —ESP and not, in addition, a traveling soul or spirit endowed with powers of ESP. For being—necessarily!—without sense organs, such an entity could acquire information, if at all, only by exercising powers of ESP.

Antony Flew
Reading, England

Leonard Angel replies:

In regard to Paul Edwards's points: (1) "Angel claims that he is the first person to offer a critical examination of one of Stevenson's cases." Actually, I said that detailed examinations of the content of the Twenty Cases material are "hard to come by." I appreciate the references. (2) I did not object to reliance on Chari for dismissal of Stevenson's cases on the preposterous grounds that Chari is a parapsychologist. Rather, the problem is that Chari thinks that the best of the empirical work on survival indicates a paranormal factor, and from his point of view, apparently, this may well include the best non-Indian cases of Stevenson for anyone interested in the paranormal generally rather than in reincarnation specifically (versus ESP). (3) Edwards's sharp distinction

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between "conceptually incoherent" and "highly improbable" doesn't match what I take to be the successful component of the arguments he actually uses. For instance, he says that the "womb invasion" theory is "empirically vacuous and . . . cannot possibly fill any gaps or be any supplement to scientific knowledge." On the contrary, the womb invasion theory might be a good explanation of data different from the data we have. It's the evidence we have of mind's dependence on brain, etc., which Edwards skillfully presents, that makes womb invasion (along with ESP) extremely improbable in relation to background empirical beliefs. For a detailed discussion of my views on how mind-over-matter theories, in principle, could be good empirical theories, and what is and is not conceivable in mind-brain relations and various paranormal "logical possibilities," see my Enlightenment East and West *(SUNY Press, Albany, 1994), pp. 254-268.*

With regard to Antony Flew's point, both past-life claims and OBEs have phenomenological features that would have to be entered into the data pool for explanation if the informational matches could not be explained normally. For instance, in past-life claims, the child experiences the facts as apparently sourced in personal memory and might well exhibit no other paranormal abilities. Such specificity would need specific explanation. In the OBE cases, the subject would seem to receive the paranormally obtained facts as though a mental substance were floating along through the world. The phenomenological features there too would need specific explanation and could result in a preference for the OBE hypothesis over an ESP one—again, if *(yes, a big if!) the data warranted. Scope and specificity of data covered must be considered along with economy in entities postulated.*

Ian Stevenson's response to Leonard Angel's article will appear in our next issue.—ED.

Ozone controversy

Having become accustomed to the meticulous manner in which most articles in the SKEPTICAL INQUIRER are written, I was shocked to see the publication—apparently without critical review—of Boyce Rensberger's "A Reader's Guide to the Ozone Controversy" (*SI*, Fall 1994). There are numerous factual errors in his article, but three major ones stand out; correcting them completely undermines his conclusions. These are:

1. Rensberger states that "in the year 2000 . . . the ozone layer should start slowly getting thicker." He bases this on a chart that shows the prospective chlorine content of the stratosphere as a function of time.

The chlorine content of the stratosphere does not directly represent its ozone content. It is instead an approximate measure of the *rate of depletion* of ozone. If future trends do indeed follow this curve, it means that ozone depletion will occur *at an increasing rate* until the year 2000. It will then continue to occur at a gradually decreasing rate far beyond the chart's end in 2060. The curve shows that the amount of ozone depletion to he expected over the 40-year period 1990-2030 will be about twice as great as that which took place between 1950 and 1990 (and which aroused the present concern). Even in the 40 years beyond that (2030-2070) the amount of depletion will exceed that which has already taken place. This means that, even viewed with the most optimistic outlook, our problems with man-made ozone depletion have just begun. . . .

2. Rensberger also claims that research has "failed to turn up any evidence of increased UV influx outside the Antarctic region." For a number of years, biologists have been concerned about severe declines in amphibian population in areas at least as far south as Colorado. Studies conducted in the state of Washington have shown that the numbers of frogs that happen to lay their eggs in direct sunlight has declined precipitously, while those that place theirs in the shade have remained almost unaffected. So far, no other plausible explanation has been offered for this phenomenon other than an increase in ultraviolet radiation.

There is still much to be learned about ozone depletion. It may indeed turn out to be nothing more than a minor inconvenience. It may be that the ozone lack in the stratosphere will merely allow the same UV to form it lower in the troposphere. But we cannot be sure of this; it is just as possible that this will become a major calamity instead. It is a threat we cannot afford to neglect.

J. Richard Guadagno
Paonia, Colo.

I was delighted to see "A Reader's Guide to the Ozone Controversy." I have been gathering information about it for years. Let me add something.

Boyce Rensberger tells us there is no crisis because CFCs are being phased out before disaster happens. He does not mention the enormous expense of replacing hundreds of millions of refrigeration and air-conditioning units, because the substitutes will not work in existing units.

This does not come cheap. One estimate is $5 trillion worldwide. Add to this the increased food spoilage, disease, and death in third-world countries where money for conversion is simply not available.

Have we been "conned"? Is the whole crisis a phony?

Boyce Rensberger accepts the popular idea that CFCs have actually caused some damage to the ozone layer. After all, every time CFCs are mentioned in the media we see the words "ozone destroying." Is it true?

The whole panic is based on the Rowland-Molina (R-M) theory, which says CFC is broken up by ultraviolet, releasing chlorine. Chlorine then destroys ozone like a catalyst.

Any encyclopedia tells us that ozone is created when a high-energy photon hits an oxygen O_2 molecule, breaking it into two O atoms. Each finds an O_2 and grabs it to make O_3 ozone.

The R-M theory describes what happens when chlorine is present. A chlorine atom hits an ozone molecule O_3 and combines with it to make oxygen O_2 and chlorine monoxide ClO. Scratch one ozone molecule. Then to release the chlorine for further destruction we need an O atom.

1. $Cl + O_3 \longrightarrow ClO + O_2$
2. $ClO + O \longrightarrow Cl + O_2$
Net: $O + O_3 \longrightarrow 2O_2$

But wait—something is missing. One of the characters is not accounted for, like in a Perry Mason mystery. Where did we get that O atom in step 2? The only source of free O atoms is UV photons hitting O_2 molecules. Each hit releases *two* O atoms. What happens to the *second?* Obviously it will find an O_2 atom to make O_3 ozone. Thus every time an ozone molecule is destroyed, another is created. Chlorine does not destroy ozone, we have only a break-even condition. . . .

This "clinker" in the theory is my own discovery. I have seen it nowhere in print. If I am wrong, where is my error?

Everett De Jager
Cincinnati, Ohio

I agree with the NASA scientist who stated that Rensberger's article has good scientific facts in it—but nevertheless Rensberger's *tone,* at times, comes across as anti-environmental *in general.* That is, Rensberger's article takes one example—the ozone hole—and extrapolates from this to give the impression that the entire environmental movement is nuts—or, in his terms, "alarmist."

It seems to me that environmentalist groups have performed an important role by initially publicizing the dangers of a growing ozone hole. This publicity is what caused world governments to take appropriate actions to correct the ozone problem—i.e., through outlawing the use of fluorocarbons. Rensberger seems (passively) to indicate he is in favor of these current actions—and that the cessation of fluorocarbons is a major factor in allowing the earth's atmosphere to naturally renew its reserves of ozone by the year 2000.

The reason this is an important point is that some individuals have indicated that the ozone hole problem is merely a "hoax." That is, world governments should *not* be taking any actions at all! In my own neck of the woods, the North Texas Skeptics association took just this position in arguing that there was no need to ban the use of fluorocarbons. Our local skeptics reporter explained that he was personally angered by the ban because it meant that his air-conditioning bills were going to be higher in the future. My local skeptics chapter saw no need to present other "scientific" views on the subject. . . .

Patricia Traynham
Dallas, Tex

Boyce Rensberger's article completely misses the real problem embedded in the ozone controversy.

There is little doubt in the scientific community that measured levels of stratospheric ozone are declining—whether this is permanent, temporary, natural, or the result of industrial activities is beside the point.

It is a fact that ozone adsorbs wavelengths of ultraviolet harmful to life. If there is less ozone, why isn't there more UV? Why do we not have accurate, long-term (or short-term for that matter) studies of "natural" ultraviolet radiation on earth?

Rensberger does an excellent job of exposing the exaggerated claims arising from the lack of reliable data, but he misses the truly monumental story—where are the *measurements* of ultraviolet on the surface of the earth? And if there are no consistent measurements, why not? The debate so far has been over surrogate measurements of ultraviolet (i.e., ozone) and what this *might* imply, not direct measurements of UV and what this actually means.

There are modern, inexpensive plug-and-play instruments available "off the shelf" that can be networked and operated remotely and cheaply, without teams of Ph.D. engineers. Unfortunately, unglamorous hard work doesn't seem to fit the American style any more. A committee of U.S. scientists has been studying how to study UV since at least 1991, with no sign of anything productive in sight.

The real story behind the "Ozone Story" is that there is no "Ultraviolet Story"! What we need are more skeptical inquirers.

Jim Scanlon
San Rafael, Calif.

Boyce Rensberger responds:

I think I can clear up some misunderstandings. J. Richard Guadagno is right in saying ozone depletion will continue for several decades to happen at a faster pace than was the case before 1950. But he is wrong in asserting that the chlorine content of the stratosphere does not represent its ozone content. Actually, according to the atmospheric scientists I have interviewed, it does so, and rather closely at that. The fact is that new ozone is created so rapidly—by the very process De Jager cites—that just as soon as the chlorine load (which is about equal to the rate of ozone destruction) starts to go down, the ozone level starts to go up.

It won't get all the way back to the levels typical of the first half of this century until late in the next, but the amount of depletion is now expected to start declining around 1998. (CFC releases are now dropping even faster than predicted when I wrote the story.)

As for the frogs, I must correct Guadagno. Declines in frog populations do afflict species that lay eggs in dense forest, well shielded from ultraviolet even without an ozone layer. And they afflict species living in the tropics, where the ozone layer has not eroded appreciably. And, according to Andrew R. Blaustein of Oregon State University, the scientist whose research on amphibian decline captured headlines in 1994, the cause cannot be as simple as ultraviolet radiation alone. I covered that story and Blaustein told me there are many other possible causes of this genuinely lamentable phenomenon. Prominent among these is a fungal disease that is thriving in fish hatcheries around the world, now that certain pesticides are no longer used. The fungus is known for sure to be the main cause of death in a UV-sensitive frog species. Other researchers blame the amphibian die-off on habitat destruction and long-lived pesticides in the water. Amphibian eggs, lacking shells, are acutely vulnerable to chemical toxins.

De Jager, although right about how ozone is formed in the first place, is on shaky ground to reject the CFC hypothesis. The chemistry is too complex to go into here, and not all possible chemical pathways are known, but I have never heard of a working atmospheric scientist rejecting the Rowland-Molina scenario. Even Fred Singer, a former atmospheric scientist who leads a conservative group that campaigns against environmentalist exaggeration and who once doubted the CFC theory of ozone destruction, now agrees that the Rowland-Molina scenario is correct.

As for Scanlon's doubt that there are measured increases in ultraviolet striking the ground, I agree for the most part. The problem is that UV levels fluctuate wildly all the time for entirely natural reasons and one would have to collect data over many years to get a baseline from which to detect an increase.

Finally, I'm sorry Patricia Traynham read my piece as anti-environmental. I will admit that I tried to use an even, non-alarmist tone. That's what may have made it seem to conflict with the usual tone of environmentalist reporting. The real bottom line, I think, is that the CFC ban was a major and welcome success story for the environmental movement.

Belief, truth, and Bigfoot

In Michael R. Dennett's well-written and informative article, "Bigfoot Evidence: Are These Tracks Real?" Grover Krantz seems to be missing the whole point of scientific inquiry in his search for Bigfoot. He is saying that his assertions are true because he says they are true.

Even experts cannot dictate truth in science, and science does not advance by circular reasoning.

Unfortunately for his claims, Krantz's concept of truth is not clear enough to either prove or disprove the existence of Bigfoot. A patent illustration of this misconception is his statement, "The first time I ever heard of these things . . . I believed it instantly. But did I think they were real: no, no way!"

Krantz is misusing either the word "believe," or the word "real," or both. It is impossible for anyone to hold a belief without judging the object of the belief to be true. If Krantz uses the word "real" to mean "true," he is saying he subscribes to the truth of something he thinks is false, or the reality of something he thinks is imaginary.

I think what Krantz meant by his statement was that when he heard of Bigfoot he hoped with all his emotions that it was true. He has since set out to prove that his emotions were not misguided.

Nevertheless, I get the impression that Krantz is an intelligent man impeded by faith. Krantz, and the rest of us, would benefit if he could find the courage to question his own authority.

Matthew A. Isham
Lexington, Ky.

The Sasquatch problem certainly has been plagued with hoaxes of late, and it is my personal opinion that the tracks at Mill Creek were fakes. Many other Bigfoot investigators agree.

But this is no reason to completely write off the possibility that these creatures may actually exist. To date, we have more than 3,000 reported sightings of Sasquatch, many long trails of good footprints—showing many variations in toe placement and weight distribution—that were not dealt with in the article, and a 1967 film that could very well show a member of an undiscovered species of North American primate. In addition, we have some puzzling hair samples and other evidence that needs some explanation. The scientific community, as a whole, simply ignores the topic. With the nonsense reports that we are getting now, this is not likely to change. . . .

Kenneth A. Sayers
Anderson University
Anderson, Ind.

Worries about false memories

Martin Gardner's "The Tragedies of False Memories" (*SI*, Fall 1994) was quite informative, but I worry about the general message he gave about therapy, therapists, and buried memories.

Anybody who works with children knows just how impressionable they are. Their very impressionability allows them to learn, develop creative thinking, and understand the complex world around them. We can have fun with them as we speak of fantasy creatures like Santa Claus, the Easter Bunny, and Mother Goose. After all, we have convinced them they're real for our own innocent amusement.

When innocent amusement becomes personal gain at the expense of the children and others around them, it is no longer "fun" or "funny." My heart goes out to the accused who are truly innocent of these terrible crimes against children. I am, though, very concerned about the long-term effects of implanted memories in the children. These memories are recalled as real. The children may have not physically experienced the assaults suggested, but these acts of violence and humiliation are now part of their psyches. The violation goes beyond implanted memories. These unfortunate little ones have been molested by the therapists, officials, and other adults responsible for the memories. What has happened is "psychological rape."

But let's not forget, in our anger, the cases of true hidden memories, true child abuse and neglect, and the many well-trained social workers, therapists, and police officers who have dedicated their lives to helping them and bringing potentially dangerous people to justice.

Theresa B. Johnson, M.D.
Phoenix, Ariz.

I have read with interest Martin Gardner's two articles on false memory syndrome (*SI*, Fall 1994 and Summer 1993). Gardner accepts that real abuse goes on but also implies that an enormous number of cases involve false memories. What is vital, therefore, is to find criteria that distinguish false memories from real. I looked in vain for these in the articles, and I do not see how Gardner can be so authoritative without stating them.

Also, more than memory is involved. Associated with these memories are very strong emotions. What, if the memories are false, is the source of these?

I do accept that negative emotions can get tangled with false memories—for example, in supposed UFO-abduction cases (which I do not believe occur). But I think that these should be distinguished from the simple example of memory implantation in a child, devoid of deep emotional content, which Gardner described.

Anthony Garrett
Cambridge, England

For more on this subject, see Elizabeth Loftus's article "Remembering Dangerously," in this issue.—ED.

Science and metaphysics

Robert A. Baker's generally thoughtful review (*SI*, Fall 1994) of Susan Blackmore's book *Dying to Live* contains several regrettable misunderstandings concerning the critical distinction between science and metaphysics. Baker asserts: "Whether we like it or not, there is no future heaven toward which evolution is progressing, nor is there any ultimate cosmic purpose to the universe we inhabit. . . . Evolution . . . makes it very hard for us to accept not only the idea of evolution but also our own 'individual pointlessness'" (p. 525).

None of Baker's assertions, however, lies within the boundaries of science. As the late philosopher of science Karl Popper pointed out, the crucial criterion of demarcation between science and metaphysics is falsifiability. Only scientific statements are susceptible to disproof. Teleological assertions concerning the ultimate purpose (or lack of purpose) of our existence on this planet cannot be falsified and thus lie outside the boundaries of science and of such journals as the SKEPTICAL INQUIRER.

Blackmore's arguments regarding the potential physiological underpinnings of near-death experiences (NDEs) represent an important contribution to science, but they are entirely irrelevant to the question of the existence of life after death. The discovery of a biological basis for NDEs in no way demonstrates that such experiences are not of spiritual or religious origin; it simply demonstrates

that the claim that such experiences cannot be explained in physical terms and therefore must be of spiritual or religious origin is untenable.

As scientists, we bear an obligation to both ourselves and the general public to be clear about the kinds of questions that our methods can and cannot answer. Statements such as Baker's are both (1) divisive, in that they are likely to alienate the critical thinkers among us who remain open to the possibility of God and (2) misleading, in that they imply that scientific and metaphysical claims are mutually exclusive. Such claims are orthogonal and lie on two completely different planes of explanation. A hackneyed expression in pop psychology implores us to "maintain clear boundaries." All skeptical and careful scientists should strive to do the same.

Scott Lilienfeld, Asst. Prof.
Department of Psychology
and
Lori Marino, Visiting
Research Scholar
Department of Biology
Emory University
Atlanta, Ga.

Robert A. Baker's thorough review of *Dying to Live*, by Susan Blackmore, has prompted me to add these comments: In reading Blackmore's book, one of the more interesting impressions I have derived from it is that Blackmore herself, though prepared for an eventual demise, is also like many of the rest of us, still grasping for a reason not to fear death. She makes several references to early Buddhist philosophy and invokes such classics as the Tibetan Book of the Dead, in part, at least, to convince us that "we" never were the "we" we thought we were, that there is no real "we" alive as well, and that therefore no death to fear.

In effect, Blackmore is denying "I"-centered life (instead of what most Westerners deny—eventual death). It looks like the flip side of the coin to me! Regardless, Blackmore may very well be dead-right in just about every argument she presents in her book, including her thoughts on classical Buddhism. I am thus disappointed that she opted not to offer much of an explanation as to how the Buddhistic insight could (if genuine) have been so profound. That is, how was it derived? Probably it was the result of certain (normal though not common) experiences, contemplation of the type that involves reasoning, the pulling together of certain basic facts that added up just right—and just plain chance-type good luck.

Still, I wish Blackmore had gone into this matter more thoroughly than she did. It might have offered even further insights into the nature of near-death experiences, from the position of an expert on the subject, as well as how to live the good life.

Denny Nichols
Eaton Rapids, Mich.

Is Consumer's Union getting soft?

In Articles of Note (Fall 1994, p. 533) you mention, approvingly, the recent series from *Consumer Reports* called "Alternative Medicine: The Facts." However, the first two articles of this series, on acupuncture and homeopathy, provide nowhere near the blunt evaluation we would have expected from the old Consumer's Union.

For years Consumer's Union was a sound source of medical information and a powerful opponent of quackery. But now it seems that CU has taken on some New Age overtones and is getting soft on quackery. The article on acupuncture starts off with anecdotes; although it indeed repeatedly cautions that there is no scientific support for acupuncture, the anecdotes make this ancient sham seem attractive. There is even a full-page section on what to look for when selecting an acupuncturist! The old CU would have forcefully dismissed it as quackery.

The next issue had, believe it or not, an equivocating article on homeopathy, a form of quackery so silly that any moron ought to see through it. Yet CU's story, packed with misleading assertions, managed to make it look almost respectable.

To test the effect of these articles on the average reader, we gave them to some of our patients to read, and most of them thought the articles were favorable to acupuncture and homeopathy! Again this demonstrated the powerful effect of anecdotes on those not trained in critical thinking.

Happily the third article, on chiropractic, was in the best tradition of the old CU. It was blunt and unapologetic in its negative assessment of this most popular dubious healing art.

Marvin J. Schissel, D.D.S.
National Council Against
Health Fraud
New York Chapter
Woodhaven, N.Y.

Deep ecology and ecofeminism

I was greatly irritated by Ralph Estling's column "Deep Ecology or Deep Sanity" (*SI, Fall 1994*). He begins by admitting, "I had never heard of Deep Ecology or Deep Sanity" and "I wouldn't want to go on record as being all that sure what ecofeminism is." After saying that he knows nothing about these subjects, he goes on with an assortment of snide jabs about the people who do hold some of these beliefs. This is not skepticism, this is ignorance. Worse, it is arrogant ignorance in that he seems to imply that it is possible to know that these are worthless theories without knowing anything about them.

What I like about *SI* is that articles in this magazine usually provide me with useful information about a paranormal or fringe-science claim and, consequently, I am able to make an informed decision. If one knows *nothing* about a subject under discussion, he or she is in no position to be an effective debater against those who do hold the beliefs or who have *some* information about the subject. Paul Quincey's article on tides in the same issue is a good example of how *SI* provides exactly that scientific information needed to debunk fringe-science claims.

I do happen to know some things about Deep Ecology and ecofeminism as possible religious and/or philosophical orientations. As such, debunking them is as tasteless as an article on the impossibility of the Virgin Birth. However, if people who have these worldviews are promoting false scientific claims, I think this would be an appropriate subject for an article in *SI*.

Maybe Estling's column was meant to be humorous, but it went right over my head. I think it was a waste of space.

Catherine Lilly, Chair,
Dept. of Mathematics
Westfield State College
Westfield, Mass.

Ralph Estling replies:

I'm sorry I greatly irritated Catherine Lilly, but there you are, the deed is done. Yes, as a matter of fact I do know about New Age ecologies. Yes, the column was meant to be slightly humorous. It was also meant to make a point: that if we grow up we may just possibly save ourselves and our world. If we don't grow up we are most unlikely to save anything, a sense of humor, a sense of perspective, a sense of reality, sense itself. And then things, even the most obvious of things, will become hard for us to understand and, not understanding, we will become greatly irritated, points will go over our head, and we will conclude that they are a waste of space. Because we don't understand.

For my part I don't understand why debunking Deep Ecology and ecofeminism, as possible religious and/or philosophical orientations, is tasteless or, for that matter, why debunking virgin births is. All infantilisms engaged in by adults are worth debunking, at least once. After that we may get a bit tired of the whole sad and silly business of suggesting to grown-ups that they ought to think and act like small, and rather backward, children. If memory serves me rightly, someone with a religious orientation once wrote that when he was a child he thought as a child. But when he became a man he put away childish things.

Science and antiscience

An important point has been overlooked in the discussion of science vs. antiscience (*SI*, Letters, Fall 1994). In the popular mind, science and technology are hopelessly confused. They are two very distinct enterprises. Even Paul Kurtz has fallen somewhat into this error and the Reverend Theolinda Knight, too. Technologists use the results of science, but this is totally irrelevant to the validity of the scientific method in understanding objective reality. Science is not amoral in one sense. The overriding question is, "Is it true?" If the experimental data don't agree with the theory, the theory falls. Furthermore, science has predictive capability. These attributes are culture-invariant. None of the antiscience philosophies can make these claims. . . .

Michael Wales
Kula, Hawaii

Two letters of those in response to Paul Kurtz's article "The Growth of Antiscience" struck me particularly. One was by Thomas Lifvendahl and the other was by the Reverend Theolinda Knight. Lifvendahl must have been innoculated with deconstructionism, because he wrote a singularly tortured and obscure letter. No wonder the deconstructionists say that words have no meaning!

He did say, in a relatively understandable way, that science is not to be trusted because it "has become an instrument at the disposal of powerful groups within the dominant segments of our society." Well, if Lifvendahl were accustomed to observing evidence and associating it with conclusions he would have long ago noticed that *all* social phenomena are used by the rich and powerful to get and maintain their riches and power. That includes postmodernism. And who is most likely to be able to spot a flimflam, someone who pays attention to evidence and actions or someone who depends on intuition? Get real, will you?

The Reverend Knight illustrated her point about science by reference to accidents in technology, such as at nuclear power plants. And there are dangers in technology that, I think, are the result of technologists' mental bias and training. I am a technologist who was in the weapons-design business for more than 30 years, and I know whereof I speak. We technologists like to solve problems, and we are trained in problem-solving. When someone presents something to us as a problem, we tend to jump in and try to solve it. We should be more ready to pause and ask, "Is this really a problem?" . . .

Most of the postmodern criticism of "science" is really about technology, most of which the postmodernists would be extremely reluctant to do without. And most of them write in obscure jargon, using invented words or using common words according to invented definitions of their own, and then complain that "words have no meaning." If they are right, why should we pay any attention to what they write? And if they are wrong, why should we pay any attention to what they write?

David J. Simmons
Ridgecrest, Calif.

Pseudoscience on CBS

The unabashed acceptance of pseudoscience as an accurate portrayal of facts on mainstream, network television continues unabated. The prime-time CBS presentation of the made-for-TV movie "Cries from the Heart" (October 17, 9:00 P.M. EDT) portrays Facilitated Communication (FC) as the only "credible" evidence offered in the successful prosecution of an alleged sex offender.

The victim of the asserted offense, under ten years old, admittedly autistic and retarded, "testified" utilizing FC. The facilitator was prominently shown looking *straight ahead* as the youngster responded cogently to questions, in my opinion, more convincingly than many "normal" young children his age.

I am not aware of any verifiably successful instance of FC. This movie makes the statement that there are instances of fabricated FC, but in this instance, with the facilitator obviously nonattentive to the child or keyboard (looking straight ahead), a heinous criminal was justly punished.

Are we fighting a losing battle? Your journal's reach is to several thousands. CBS's reach is in the tens of millions.

Arthur Pomerantz
Craigsville, Va.

As we reported in our January/February 1995 issue, the American Psychological Association has stated that Facilitated Communication has no scientifically validated support for its efficacy.—ED.

Nessie 'model' explanation suspect

Your news item about "the surgeon's photograph" of Nessie ("Most Famous Nessie Photo a Hoax," Summer 1994) is flawed on several counts.

The image has not withstood rigorous scientific examination, especially not mine. In 1984 I showed, "conclusively," that the object was consistent with an otter's tail only meters or so from the camera. For this and other reasons, I concluded that it was a hoax.

Whether or not David Martin and Alistair Boyd have "established" that the picture shows a model monster remains to be seen. Perhaps you are not aware that the next issue of the *Sunday Telegraph* (March 20, 1994) following the hoax relevation carried two critical letters, one of them from me. F. David Crump, the owner of more than one clockwork submarine in the 1920s, wanted more evidence of the type of vessel that supposedly carried the bogus monster. He claimed that there were only two sizes, the

largest only one foot long. It could not have supported a lead weight of any kind and a mass of plastic wood 12 inches tall would have capsized it. I asked how a stationary model could create the ripple rings evident in the picture and pointed to the problem of Wilson's second picture, which shows a quite different object. Alistair Boyd has not seen fit to answer my questions, and it must be considered that this "model" explanation is as suspect as most of the others. No explanation for a paranormal claim should be accepted without adequate evidence. In their eagerness to undermine paranormal claims, writers in *SI* exhibit a tendency to accept any normal explanation, whether or not there is adequate evidence.

Steuart Campbell
Edinburgh, Scotland, U.K.

The letters column is a forum for views on matters raised in previous issues. Letters should be no more than 250 words. Due to the volume of letters, not all can be published. They should be typed double-spaced. Address: Letters to the Editor, SKEPTICAL INQUIRER, 944 Deer Dr. NE, Albuquerque, NM 87122

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ALABAMA. Alabama Skeptics, Emory Kimbrough, 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 (205-759-2624)

ARIZONA. Tucson Skeptics Inc. James McGaha, Chairman, 7049 E. Tangue Verde Rd., Suite 370, Tucson, AZ 85715. **Phoenix Skeptics,** Michael Stackpole, Chairman, P.O. Box 60333, Phoenix, AZ 85082.

CALIFORNIA. Bay Area Skeptics, Wilma Russell, Secretary, 17723 Buti Park Court, Castro Valley, CA 94546. **East Bay Skeptics Society,** Daniel Sabsay, President, P.O. Box 20989, Oakland, CA 94620 (510-420-0702). **Sacramento Skeptics Society,** Terry Sandbek, 3838 Watt Ave., Suite C303, Sacramento, CA 95821-2664 (916-488-3772).

COLORADO. Rocky Mountain Skeptics, Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306 (303-444-5368).

D.C. Capital Area. National Capital Area Skeptics, c/o D.W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

FLORIDA. Tampa Bay Skeptics, Gary Posner, 1113 Normandy Trace Rd., Tampa, FL 33602 (813-221-3533).

GEORGIA. Georgia Skeptics, Becky Long, President, 2277 Winding Woods Dr., Tucker, GA 30084.

ILLINOIS. Midwest Committee for Rational Inquiry, Danielle Kafka, President, P.O. Box 2792, Des Plaines, IL 60017-2792. **Rational Examination Assoc. of Lincoln Land** (REALL), David Bloomberg, Chairman, P.O. Box 20302, Springfield IL 62708 (217-787-9098).

INDIANA. Indiana Skeptics, Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES), Chairman, Prof. Robert A. Baker, 3495 Castleton Way North, Lexington, KY 40502.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM), Dick Schroth, Director, 425 Carriage Way, Baton Rouge, LA 70808-4828 (504-766-4747).

MASSACHUSETTS. Skeptical Inquirers of New England. Contact Laurence Moss, Ho & Moss, 72 Kneeland St., Boston 02111.

MICHIGAN. Great Lakes Skeptics, Carol Lynn, contact, 1264 Bedford Rd., Grosse Pointe Park, MI 84230-1116.

MINNESOTA. Minnesota Skeptics, Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416. **St. Kloud ESP Teaching Investigation Committee** (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

MISSOURI. Kansas City Committee for Skeptical Inquiry, Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124. **Gateway Skeptics,** Chairperson, Steve Best, 6943 Amherst Ave., University City, MO 63130.

NEW MEXICO. New Mexicans for Science & Reason, John Geohegan, Chairman, 450 Montclaire SE, Albuquerque, NM 87108; John Smallwood, 320 Artist Road, Santa Fe, NM 87501 (505-988-2800).

NEW YORK. Inquiring Skeptics of Upper New York (ISUNY), Contact, Michael Sofka, 8 Providence St., Albany, NY 12203. (518-437-1750). **New York Area Skeptics** (NYASk), Wayne Tytell, contact person, 159 Melrose Ave., E. Massapequa, NY 11758, (516-798-6902). **Western New York Skeptics,** Tim Madigan, Chairman, 3965 Rensch Rd., Buffalo, NY 14228.

OHIO. South Shore Skeptics, Page Stephens, 6006 Fir Avenue, Cleveland, OH 44102 (216-631-5987). **Association for Rational Thinking** (Cincinnati area), Joseph F. Gastright, Contact, 111 Wallace Ave., Covington, KY 41014 (606-581-7315).

OREGON. Oregonians for Rationality, Contact, Bill Capron, PO Box 4739, Vancouver, WA 98662 (206-260-1896)

PENNSYLVANIA. Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 8209 Thompson Run Rd., Pittsburgh, PA 15237 (412-366-4663).

TEXAS. Houston Association for Scientific Thinking (HAST), Darrell Kachilla, P.O. Box 541314, Houston, TX 77254. **North Texas Skeptics,** Joe Voelkering, President, P.O. Box 111794, Carrollton, TX 750111794. **West Texas Society to Advance Rational Thought,** Co-Chairmen: George Robertson, 4700 Polo Pky., Apt. 183, Midland, TX 79705-1542.

WASHINGTON. The Society for Sensible Explanations, P.O. Box 7121, Seattle, WA 98133.

WISCONSIN. Contact person: Roxine McQuitty, MATC-West, 1200 S. 71st St., West Allis, WI 53214 (414-456-5402, 414-873-4446, McQuitty@Music.lib.MATC.edu).

ARGENTINA. CAIRP, Director, Ladislao Enrique Marquez, Jose Marti, 35 dep C, 1406 Buenos Aires.

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BRAZIL. Opcão Racional, Luis Gutman, Rua Santa Clara,431, Bloco 5, Apt. 803, Copacabana - Rio de Janeiro 22041-010 (021-227-8694).

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CZECH REPUBLIC. Contact Milos Chvojka, Inst. of Physics, Czech Academy of Sciences, Na Slovance 2, 1 80 40 Prague 8.

ESTONIA. Contact Indrek Rohtmets, Horisont, EE 0102 Tallinn, Narva mnt. 5.

FINLAND. Skepsis, Veli Toukomies, President, Rintamamiehentie 15, 06100 Porvoo. (358-15-5249-3200, Fax: 358-15-584-620).

FRANCE. Circle Zetetique, Contact: Henri Broch, 12 Rue David Dietz, 57000 Metz, France. **Comite Francais pour l'Etude des Phenomenes Paranormaux,** Claude Benski, Secretary-General, Merlin Gerin, RGE/A2 38050 Grenoble Cedex.

GERMANY. Society for the Scientific Investigation of Para-Science (GWUP), Amardeo Sarma, Convenor, Postfach 1222, D-64374 Rossdorf (FAX: +49 6154 81912).

HONG KONG. Hong Kong Skeptics. Contact Rebecca Bradley, P.O. Box 1010, Shatin Central Post Office, Shatin, NT.

HUNGARY. Hungarian Skeptics, Gyula Bencze, *Termeszet Vilaga,* P.O. Box 25, Budapest 8,1444. (Fax 011-36-1-118-7506).

INDIA. Indian Skeptics, B. Premanand, Chairman, 10, Chettipalayam Rd., Podanur 641-023 Coimbatore Tamil nadu. **Indian Rationalist Association,** Contact, Sanal Edamaruku, 779, Pocket 5, Mayur Vihar 1, New Delhi 110 091.

ISRAEL. Israel Skeptics Society, Philip Marmaros, Chairman, P.O. Box 8481, Jerusalem.

IRELAND. Irish Skeptics, Peter O'Hara, Contact, St. Joseph's Hospital, Limerick.

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JAPAN. Japan Skeptics, Jun Jugaku, Chairperson, Business Center for Academic Societies Japan, 16-9 Honkomagome 5-chome, Bunkyo-ku, Tokyo 113.

MEXICO. Mexican Association for Skeptical Research (SOMIE), Mario Mendez-Acosta, Chairman, Apartado Postal 19-546, Mexico 03900, D.F.

NETHERLANDS. Stichting Skepsis, Rob Nanninga, Secretary, Westerkade 20, 9718 AS Groningen.

NEW ZEALAND. New Zealand Skeptics, Vicki Hyde, Chairperson, South Pacific Publications, Box 19-760, Christchurch 5, N.Z., Fax: 64 3 384-5138.

NORWAY. NIVFO, K. Stenodegard, Boks 9, N-7082, Kattem. **Skepsis,** Terje Emberland, Contact: St. Olavsgate 27, 0166 Oslo.

RUSSIA. Contact Edward Gevorkian, Ulyanovskaya 43, Kor 4, 109004, Moscow.

SOUTH AFRICA. Assn. for the Rational Investigation of the Paranormal (ARIP), Marian Laserson, Secretary, 4 Wales St., Sandringham 2192. **SOCRATES,** Leon Retief, contact, 3 Hoheizen Crescent, Hoheizen, Bellville 7530.

SPAIN. Alternativa Racional a las Pseudosciencias (ARP). Carlos Telleria, Executive Director, Apdto. 1516, 50080 Zaragoza. **El Investigador Esceptico.** Contact Felix Ares De Blas, Gámez/Ares/Martinez, P. O . Box 904, 20080 Donostia-San Sebastian.

SWEDEN. Vetenskap dc Folkbildning (Science and People's Education), Sven Ove Hansson, Secretary, Box 185, 101 23 Stockholm.

TAIWAN. Tim Holmes, # 269 Chung Hsing Rd., Fengyuan.

UKRAINE. Perspective, Oleg G. Bakhtiarov, Director, 3-B Khmelnitskogo St., 252001 Kiev.

UNITED KINGDOM. SKEPTICAL INQUIRER Representative, Michael J. Hutchinson, 10 Crescent View, Loughton, Essex IG10 4PZ. **The Skeptic** magazine, Editors, Toby Howard and Steve Donnelly, P.O. Box 475, Manchester M60 2TH. **London Student Skeptics,** Contact: Bill Harman, 21 Manville Rd., London SW17 8JW. **Manchester Skeptics,** David Love, P.O. Box 475, Manchester M60 2TH. **Wessex Skeptics,** Robin Allen, Dept. of Physics, Southampton Univ., Highfield, Southampton S09 5NH.

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